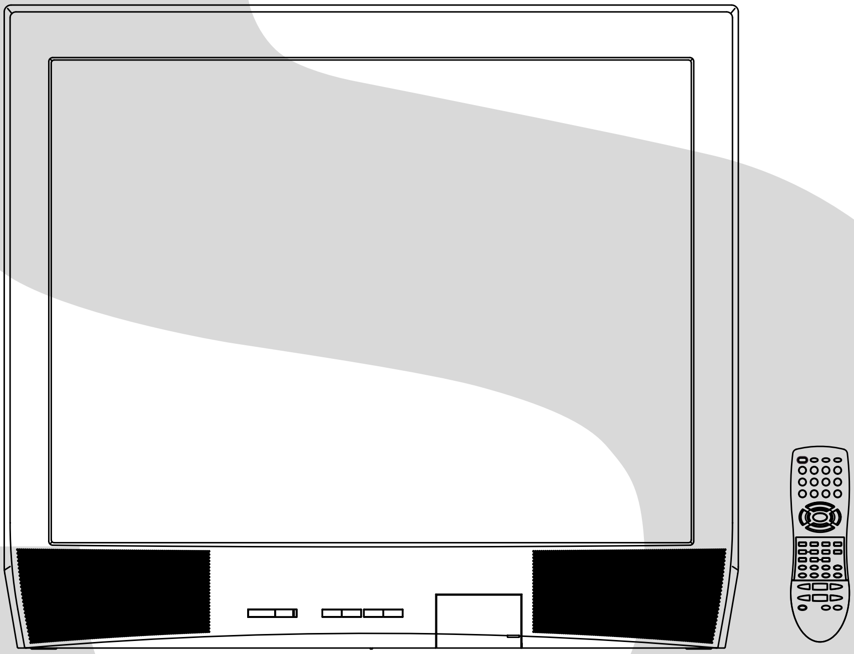
TOSHIBA

FILE NO. 050-200520
(MFR'S VERSION A)

SERVICE MANUAL

COLOR TELEVISION

32A35



DOCUMENT CREATED IN JAPAN, May, 2005

SERVICING NOTICES ON CHECKING

1. KEEP THE NOTICES

As for the places which need special attentions, they are indicated with the labels or seals on the cabinet, chassis and parts. Make sure to keep the indications and notices in the operation manual.

2. AVOID AN ELECTRIC SHOCK

There is a high voltage part inside. Avoid an electric shock while the electric current is flowing.

3. USE THE DESIGNATED PARTS

The parts in this equipment have the specific characters of incombustibility and withstand voltage for safety. Therefore, the part which is replaced should be used the part which has the same character.
Especially as to the important parts for safety which is indicated in the circuit diagram or the table of parts as a ⚠ mark, the designated parts must be used.

4. PUT PARTS AND WIRES IN THE ORIGINAL POSITION AFTER ASSEMBLING OR WIRING

There are parts which use the insulation material such as a tube or tape for safety, or which are assembled in the condition that these do not contact with the printed board. The inside wiring is designed not to get closer to the pyrogenic parts and high voltage parts. Therefore, put these parts in the original positions.

5. TAKE CARE TO DEAL WITH THE CATHODE-RAY TUBE

In the condition that an explosion-proof cathode-ray tube is set in this equipment, safety is secured against implosion. However, when removing it or serving from backward, it is dangerous to give a shock. Take enough care to deal with it.

6. AVOID AN X-RAY

Safety is secured against an X-ray by considering about the cathode-ray tube and the high voltage peripheral circuit, etc.
Therefore, when repairing the high voltage peripheral circuit, use the designated parts and make sure not modify the circuit.
Repairing except indicates causes rising of high voltage, and it emits an X-ray from the cathode-ray tube.

7. PERFORM A SAFETY CHECK AFTER SERVICING

Confirm that the screws, parts and wiring which were removed in order to service are put in the original positions, or whether there are the portions which are deteriorated around the serviced places serviced or not. Check the insulation between the antenna terminal or external metal and the AC cord plug blades. And be sure the safety of that.

(INSULATION CHECK PROCEDURE)

1. Unplug the plug from the AC outlet.
2. Remove the antenna terminal on TV and turn on the TV.
3. Insulation resistance between the cord plug terminals and the eternal exposure metal **[Note 2]** should be more than 1M ohm by using the 500V insulation resistance meter **[Note 1]**.
4. If the insulation resistance is less than 1M ohm, the inspection repair should be required.

[Note 1]

If you have not the 500V insulation resistance meter, use a Tester.

[Note 2]

External exposure metal: Antenna terminal
Headphone jack

HOW TO ORDER PARTS

Please include the following informations when you order parts. (Particularly the VERSION LETTER.)

1. MODEL NUMBER and VERSION LETTER
   The MODEL NUMBER can be found on the back of each product and the VERSION LETTER can be found at the end of the SERIAL NUMBER.
2. PART NO. and DESCRIPTION
   You can find it in your SERVICE MANUAL.

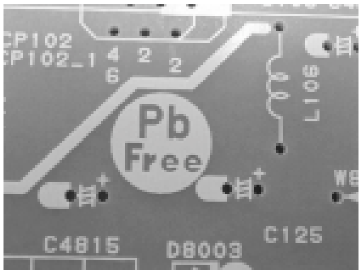
IMPORTANT

When you exchange IC and Transistor with a heat sink, apply silicon grease on the contact section of the heat sink. Befor applying new silicon grease, remove all the old silicon grease. (Old grease may cause damages to the IC and Transistor.)

ABOUT LEAD FREE SOLDER (PbF)

Distinction of PbF PCB:

PCBs (manufactured) using lead free solder will have a PbF printing on the PCB.
(Please refer to figures.)



Caution:

- Pb free solder has a higher melting point than standard solder;
  Typically the melting point is 50°F~70°F(30°C~40°C) higher.
  Please use a soldering iron with temperature control and adjust it to 650°F ± 20°F (350°C ± 10°C).
  In case of using high temperature soldering iron, please be carefull not to heat too long.
- Pb free solder will tend to splash when heated too high (about 1100°F/ 600°C).
- All products with the printed circuit board with PbF printing must be serviced with lead free solder.
  When soldering or unsoldering, completely remove all of the solder from the pins or solder area,
  and be sure to heat the soldering points with the lead free solder until it melts sufficiently.

Recommendations

Recommended lead free solder composition is Sn-3.0Ag-0.5Cu.

TABLE OF CONTENTS

GENERAL SPECIFICATIONS

G-1	**TV System**	CRT	CRT Size / Visual Size	32 inch / 800.1mmV
			CRT Type	Normal
			Magnetic Field BV/BH	+0.45G/0.18G
		Color System		NTSC
		Speaker		2Speaker
			Position	Front
			Size	1.8 x 3.9 Inch
			Impedance	8 ohm
		Sound Output	M3N5-16	5.0 + 5.0 W
			10%(Typical)	- W
		NTSC3.58+4.43 /PAL60Hz		No
G-2	**Tuning System**	Broadcasting System		US System M
		Tuner and Receive CH	USA	1Tuner
			Destination	USA(W/ CATV)
			TO-A/USA CH Coverage	2 - 69, 4A, A-5 - A-1, A - I, J - W, W+1 - W+84
		Intermediate Frequency	Picture(FP)	45.75MHz
			Sound(FS)	41.25MHz
			FP-FS	4.50MHz
		Preset CH		No
		Stereo/Dual TV Sound		Yes
		Tuner Sound Muting		Yes
G-3	**Power**	Power Source	AC	120V AC 60Hz
			DC	-
		Power Consumption	M3N5-15	130 W at AC 120 V 60 Hz
			Stand by (at AC)	3 W at AC 120 V 60 Hz
			Per Year	-- kWh/Year
		Protector	Power Fuse	Yes
			Safety Circuit	Yes
			IC Protector(Micro Fuse)	No
G-4	**Regulation**		Safety	UL
			Radiation	FCC
			X-Radiation	DHHS
G-5	**Temperature**		Operation	+5oC ~ +40oC
			Storage	-20oC ~ +60oC
G-6	**Operating Humidity**			Less than 80% RH

GENERAL SPECIFICATIONS

G-7	**On Screen Display**	Menu			Yes
			Menu Type		Icon
			Picture		Yes
				Contrast	Yes
				Brightness	Yes
				Color	Yes
				Tint	Yes
				Sharpness	Yes
			Audio		Yes
				Bass	Yes
				Treble	Yes
				Balance	Yes
				BBE On/Off	No
				Stable Sound On/Off	Yes
				Surround On/Off	Yes
			Set Up		Yes
				TV/CABLE(CATV)	Yes
				CH Program	Yes
				Add/Erase	Yes
			Option		Yes
				Language	Yes
				V-chip	Yes
				CH Label	Yes
				Favorite CH	Yes
				Lock	Yes
				On/Off Timer	Yes
				Color Stream DVD/DTV	Yes
			Control Level		Yes
				Volume	Yes
				Brightness	Yes
				Contrast	Yes
				Color	Yes
				Tint	Yes
				Sharpness	Yes
				Tuning	No
				Bass	Yes
				Treble	Yes
				Balance	Yes
				Back Light	No
			Stereo,Audio Output,SAP		Yes
			Video		Yes
			Color Stream		Yes
			Channel(TV/Cable)		Yes
			CH Label		Yes
			Game Timer		Yes
			Sleep Timer		Yes
			Sound Mute		Yes
			V-chip Rating		Yes
			16: 9		No
G-8	**OSD Language**				English French Spanish
G-9	**Clock and Timer**	Sleep Timer		Max Time	120 Min
				Step	10 Min
		On/Off Timer		Program(On Timer / Off Timer / Clock)	Yes
		Wake Up Timer			No
		Timer Back-up (at Power Off Mode)		more than	-- Min Sec

GENERAL SPECIFICATIONS

G-10	**Remote Control**	Unit		RC-GW
		Glow in Dark Remocon		Yes
		Format		Toshiba
		Remocon Format		Toshiba
		Custom Code		TV:40-BF h
		Power Source	Voltage(D.C)	3V
			UM size x pcs	UM-4 x 2 pcs
		Total Keys		49 Keys
		Keys	Power	Yes
			1	Yes
			2	Yes
			3	Yes
			4	Yes
			5	Yes
			6	Yes
			7	Yes
			8	Yes
			9	Yes
			0	Yes
			100	Yes
			CH Up	Yes
			CH Down	Yes
			Volume Up	Yes
			Volume Down	Yes
			TV/Caption/Text	Yes
			CH1/CH2	Yes
			TV/Video(TV/AV)	Yes
			CH RTN/CH ENT(Quick View)	Yes
			Sleep	Yes
			RE Call(Call)	Yes
			Reset	Yes
			Menu/Enter	Yes
			Mute	Yes
			Exit	Yes
			MTS(Audio Select)	Yes
			Fav.Up	Yes
			Fav.Down	Yes
			16: 9	No
		Multi Brand Keys	CH Up(VCR)	Yes
			CH Down(VCR)	Yes
			Pause/Still	Yes
			TV/VCR(VCR)	Yes
			FF	Yes
			Rew	Yes
			Rec	Yes
			Play	Yes
			Stop	Yes
			TV	Yes
			VCR	Yes
			Cable	Yes
			DVD	Yes
			CODE	Yes
			Volume Up(DVD)	Yes
			Volume Down(DVD)	Yes
			DVD CLEAR	Yes
			TOP MENU	Yes
			DVD MENU	Yes
			DISPLAY	Yes

GENERAL SPECIFICATIONS

G-11	**Features**	Auto Degauss		Yes
		Auto Shut Off		Yes
		Canal+		No
		CATV		Yes
		Anti-theft		No
		Rental		No
		Memory(Last CH)		Yes
		Memory(Last Volume)		Yes
		V-Chip		Yes
			Type	USA,Toshiba Type
		BBE		No
		Auto Search		No
		CH Allocation		No
		SAP		Yes
		Just Clock Function		No
		CH Label		Yes
		VM Circuit		No
		Full OSD		No
		Premiere		No
		Comb Filter		Yes 3 Lines
		Auto CH Memory		Yes
		Hotel Lock		No
		Closed Caption		Yes
		Stable Sound		Yes
		FBT Leak Test Protect		Yes
		CH Lock		Yes
		Video Lock		Yes
		Game Timer (Max Time:120 Min)		Yes
		Energy Star		No
		Favorite CH		Yes
		Surround		Yes
		16:9 Mode		No
		2 Tuner P-in-P		No
G-12	**Accessories**	Owner's Manual	Language	English / Spanish
			W/ Warranty	Yes
		Remote Control Unit		Yes
		Rod Antenna		No
			Poles	
			Terminal	
		Loop Antenna		No
			Terminal	
		U/V Mixer		No
		DC Car Cord (Center+)		No
		Guarantee Card		No
		Warning Sheet		No
		Circuit Diagram		No
		Antenna Change Plug		No
		Service Facility List		No
		Important Safety Instruction		No
		Dew/AHC Caution Sheet		No
		AC Plug Adapter		No
		Quick Set-up Sheet		No
		Battery		Yes
			UM size x pcs	UM4 size x 2
			OEM Brand	No
		AC Cord		No
		AV Cord (2Pin-1Pin)		No
		Registration Card (NDL Card)		Yes
		ESP Card		No
		PTB Sheet		No
		300 ohm to 75 ohm Antenna Adapter		No

GENERAL SPECIFICATIONS

G-13	**Interface**	Switch	Front	Power	Yes
				System Select	No
				Main Power SW	No
				Sub Power	No
				Channel Up	Yes
				Channel Down	Yes
				Volume Up	Yes
				Volume Down	Yes
			Rear	AC/DC	No
				TV/CATV Selector	No
				Degauss	No
				Main Power SW	No
		Indicator		Power	Yes(RED)
				Stand-by	No
				On Timer	No
		Terminals	Front	Video Input	RCA
				Audio Input	RCA x 2
				Other Terminal	No
			Rear	Video Input(Rear1)	RCA
				Video Input(Rear2)	RCA
				Audio Input(Rear1)	RCA x 2
				Audio Input(Rear2)	RCA x 2
				Video Output	RCA
				Audio Output	RCA x 2
				S- Input	Yes
				Euro Scart	No
				Color Stream	RCA x 3
				Diversity	No
				Ext Speaker	No
				DC Jack 12V(Center +)	No
				VHF/UHF Antenna Input	F Type
				AC Outlet	No
G-14	**Set Size**			Approx. W x D x H (mm)	751 x 552 x 658.5
G-15	**Weight**			Net (Approx.)	52.0kg (114.7 lbs)
				Gross (Approx.)	58.0Kg (127.9 lbs)
G-16	**Carton**		Master Carton		No
				Content	---- Sets
				Material	-- /--
				Dimensions W x D x H(mm)	-- x -- x --
				Description of Origin	No
			Gift Box	Material	Double/Brown
				Dimensions W x D x H(mm)	840 x 625 x 787
				Design	As per Buyer's
				Description of Origin	Yes
			Drop Test		Natural Dropping At 1 Corner / 2 Edges / 4 Surfaces
				Height (cm)	40 (ORION SPEC:25)
			Container Stuffing		104 Sets/40' container
G-17	**Cabinet Material**		Cabinet	Cabinet Front	PS 94V0 DECABROM
				Cabinet Rear	PS 94V0 DECABROM
			PCB	Non-Halogen Demand	No
				Eyelet Demand	Yes
G-18	**Environment**		Pb-free Soldering		Yes
			Parts Specificat		Yes

DISASSEMBLY INSTRUCTIONS

1. REMOVAL OF ANODE CAP

Read the following **NOTED** items before starting work.

* After turning the power off there might still be a potential voltage that is very dangerous. When removing the Anode Cap, make sure to discharge the Anode Cap's potential voltage.
* Do not use pliers to loosen or tighten the Anode Cap terminal, this may cause the spring to be damaged.

REMOVAL

1. Follow the steps as follows to discharge the Anode Cap. **(Refer to Fig. 1-1.)**
   Connect one end of an Alligator Clip to the metal part of a flat-blade screwdriver and the other end to ground.
   While holding the plastic part of the insulated Screwdriver, touch the support of the Anode with the tip of the Screwdriver.
   A cracking noise will be heard as the voltage is discharged.

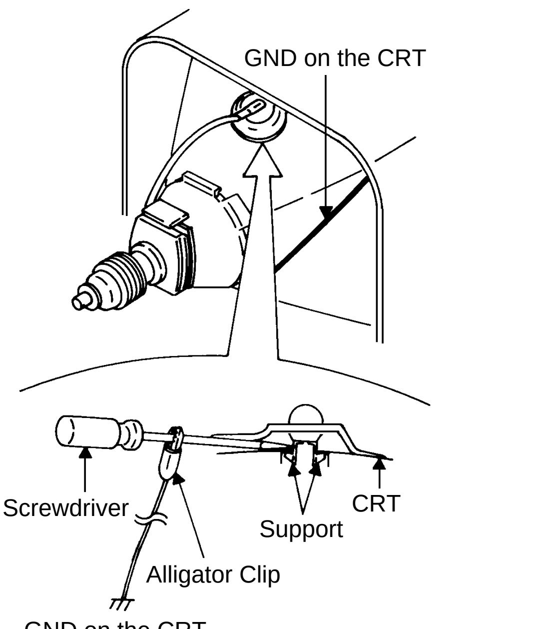


Fig. 1-1

2. Flip up the sides of the Rubber Cap in the direction of the arrow and remove one side of the support.
   (Refer to Fig. 1-2.)

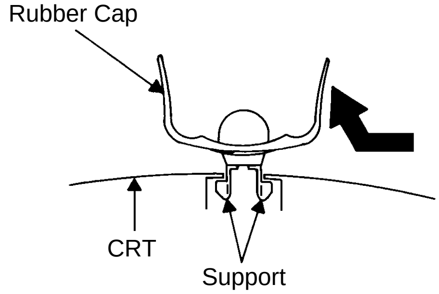


Fig. 1-2

3. After one side is removed, pull in the opposite direction to remove the other.

NOTE

Take care not to damage the Rubber Cap.

INSTALLATION

1. Clean the spot where the cap was located with a small amount of alcohol. **(Refer to Fig. 1-3.)**

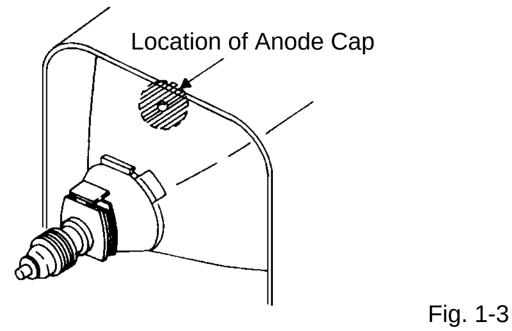
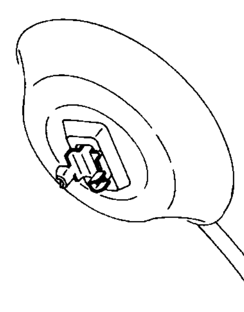


Fig. 1-3

NOTE

Confirm that there is no dirt, dust, etc. at the spot where the cap was located.

2. Arrange the wire of the Anode Cap and make sure the wire is not twisted.
3. Turn over the Rubber Cap. **(Refer to Fig. 1-4.)**


Fig. 1-4

4. Insert one end of the Anode Support into the anode button, then the other as shown in **Fig. 1-5**.

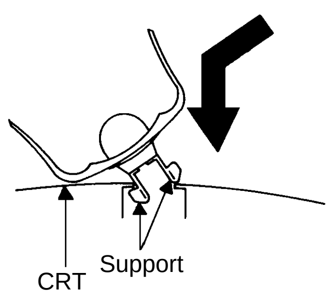


Fig. 1-5

5. Confirm that the Support is securely connected.
6. Put on the Rubber Cap without moving any parts.

DISASSEMBLY INSTRUCTIONS

2. REMOVAL AND INSTALLATION OF FLAT PACKAGE IC

REMOVAL

1. Put Masking Tape (cotton tape) around the Flat Package IC to protect other parts from any damage.
(Refer to Fig. 2-1.)

NOTE

Masking is carried out on all the parts located within 10 mm distance from IC leads.

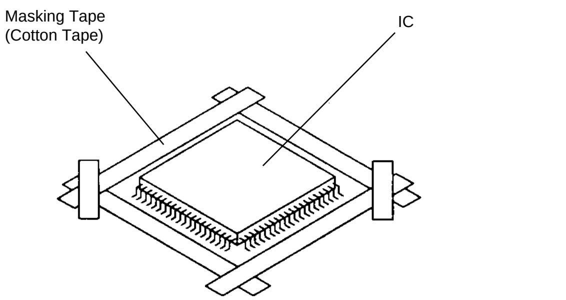


Fig. 2-1

2. Heat the IC leads using a blower type IC desoldering machine. **(Refer to Fig. 2-2.)**

NOTE

Do not rotate or move the IC back and forth , until IC can move back and forth easily after desoldering the leads completely.

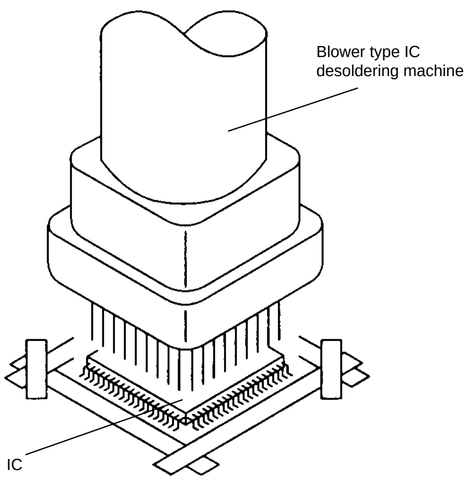


Fig. 2-2

3. When IC starts moving back and forth easily after desoldering completely, pickup the corner of the IC using a tweezers and remove the IC by moving with the IC desoldering machine. **(Refer to Fig. 2-3.)**

NOTE

Some ICs on the PCB are affixed with glue, so be careful not to break or damage the foil of each IC leads or solder lands under the IC when removing it.

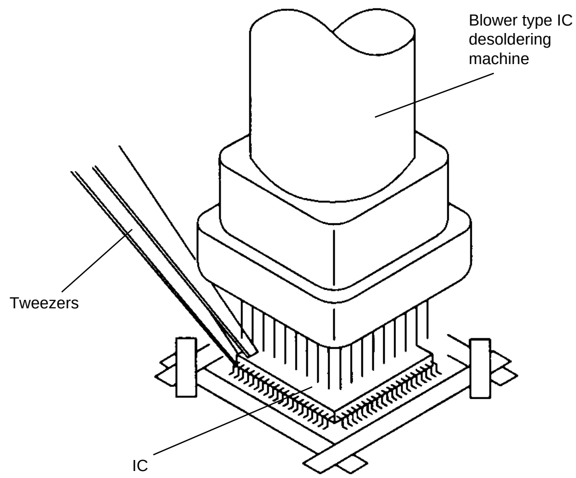


Fig. 2-3

4. Peel off the Masking Tape.

5. Absorb the solder left on the pattern using the Braided Shield Wire. **(Refer to Fig. 2-4.)**

NOTE

Do not move the Braided Shield Wire in the vertical direction towards the IC pattern.

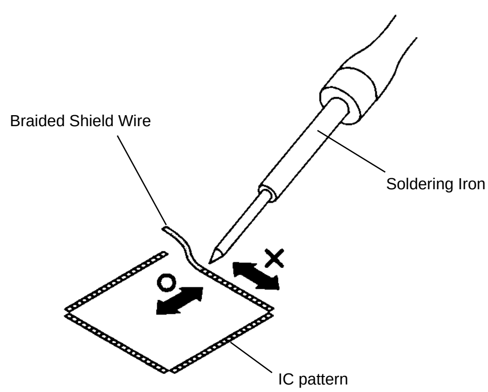


Fig. 2-4

DISASSEMBLY INSTRUCTIONS

INSTALLATION

1. Take care of the polarity of new IC and then install the new IC fitting on the printed circuit pattern. Then solder each lead on the diagonal positions of IC temporarily. **(Refer to Fig. 2-5.)**

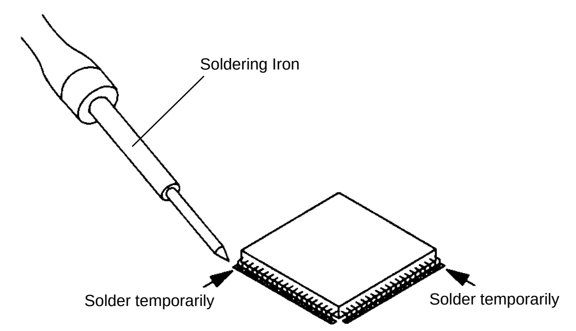


Fig. 2-5

2. Supply the solder from the upper position of IC leads sliding to the lower position of the IC leads. **(Refer to Fig. 2-6.)**

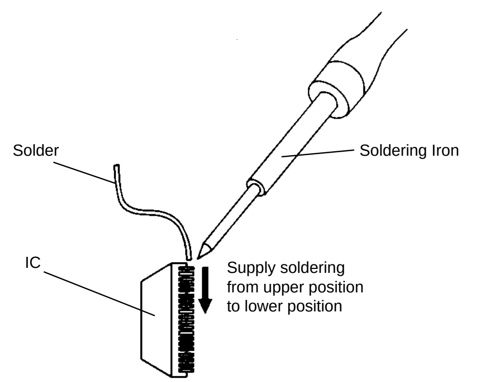


Fig. 2-6

3. Absorb the solder left on the lead using the Braided Shield Wire. **(Refer to Fig. 2-7.)**

NOTE

Do not absorb the solder to excess.

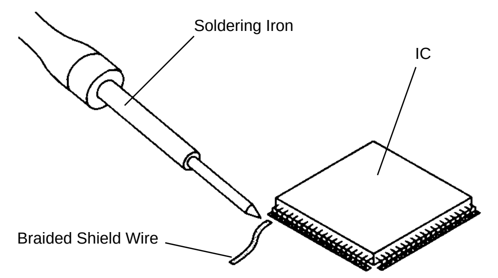


Fig. 2-7

4. When bridge-soldering between terminals and/or the soldering amount are not enough, resolder using a Thin-tip Soldering Iron. **(Refer to Fig. 2-8.)**

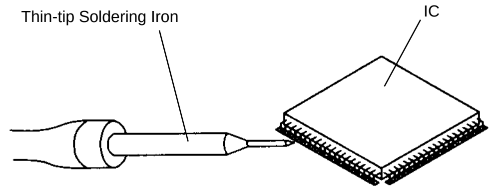


Fig. 2-8

5. Finally, confirm the soldering status on four sides of the IC using a magnifying glass.
Confirm that no abnormality is found on the soldering position and installation position of the parts around the IC.
If some abnormality is found, correct by resoldering.

NOTE

When the IC leads are bent during soldering and/or repairing, do not repair the bending of leads. If the bending of leads are repaired, the pattern may be damaged. So, always be sure to replace the IC in this case.

SERVICE MODE LIST

This unit is provided with the following SERVICE MODES so you can repair, examine and adjust easily.
To enter the Service Mode, press both set key and remote control key for more than 1 second.

Set Key	Remocon Key	Operations
VOL. (-) MIN	0	Releasing of V-CHIP PASSWORD.
VOL. (-) MIN	1	Initialization of factory data. NOTE: Do not use this for normal servicing. If you set factory initialization, the memories are reset such as the channel setting, and the POWER ON total hours.
VOL. (-) MIN	6	POWER ON total hours is displayed on the screen. Refer to the "CONFIRMATION OF HOURS USED". Can be checked of the INITIAL DATA of MEMORY IC. Refer to the "WHEN REPLACING EEPROM (MEMORY) IC".
VOL. (-) MIN	8	Writing of EEPROM initial data. NOTE: Do not use this for the normal servicing.
VOL. (-) MIN	9	Display of the Adjustment MENU on the screen. Refer to the "ELECTRICAL ADJUSTMENT" (On-Screen Display Adjustment).

CONFIRMATION OF HOURS USED

POWER ON total hours can be checked on the screen. Total hours are displayed in 16 system of notation.

NOTE: If you set factory initialization, the total hours is reset to "0".

1. Set the VOLUME to minimum.
2. Press both VOL. DOWN button on the set and Channel button **(6)** on the remote control for more than 1 second.
3. After the confirmation of using hours, turn off the power.

ADDRESS DATA

INIT 00 90 — Initial setting content of MEMORY IC.
CRT ON 0010 — POWER ON total hours.
= (16 x 16 x 16 x thousands digit value)
+ (16 x 16 x hundreds digit value)
+ (16 x tens digit value)
+ (ones digit value)

FIG. 1

WHEN REPLACING EEPROM (MEMORY) IC

If a service repair is undertaken where it has been required to change the MEMORY IC, the following steps should be taken to ensure correct data settings while making reference to TABLE 1.

NOTE: No need to set data after position INI 1F due to the adjustment value.

INI	+0	+1	+2	+3	+4	+5	+6	+7	+8	+9	+A	+B	+C	+D	+E	+F
00	90	E8	0A	65	5E	B3	24	37	39	AC	0B	04	40	40	40	9F
10	50	00	00	00	00	00	00	60	3F	0F	0D	E2	A8	21	40	00

Table 1

1. Enter DATA SET mode by setting VOLUME to minimum.
2. Press both VOL. DOWN button on the set and Channel button **(6)** on the remote control for more than 1 second. ADDRESS and DATA should appear as FIG 1.
3. ADDRESS is now selected and should "blink". Using the VOL. +/- button on the remote, step through the ADDRESS until required ADDRESS to be changed is reached.
4. Press ENTER to select DATA. When DATA is selected, it will "blink".
5. Again, step through the DATA using VOL. +/- button until required DATA value has been selected.
6. Pressing ENTER will take you back to ADDRESS for further selection if necessary.
7. Repeat steps 3 to 6 until all data has been checked.
8. When satisfied correct DATA has been entered, turn POWER off (return to STANDBY MODE) to finish DATA input.
   After the data input, set to the initializing of shipping.
9. Turn POWER on.
10. Press both VOL. DOWN button on the set and Channel button **(1)** on the remote control for more than 1 second.
11. After the finishing of the initializing of shipping, the unit will turn off automatically.

The unit will now have the correct DATA for the new MEMORY IC.

ELECTRICAL ADJUSTMENTS

1. ADJUSTMENT PROCEDURE

Read and perform these adjustments when repairing the circuits or replacing electrical parts or PCB assemblies.

CAUTION

- Use an isolation transformer when performing any service on this chassis.
- Before removing the anode cap, discharge electricity because it contains high voltage.
- When removing a PCB or related component, after unfastening or changing a wire, be sure to put the wire back in its original position.
- When you exchange IC and Transistor with a heat sink, apply silicon grease on the contact section of the heat sink. Befor applying new silicon grease, remove all the old silicon grease. (Old grease may cause damages to the IC and Transistor.)

Prepare the following measurement tools for electrical adjustments.

1. Oscilloscope
2. Digital Voltmeter
3. Multi-sound Generator
4. Pattern Generator

On-Screen Display Adjustment

1. In the condition of NO indication on the screen. Press the VOL. DOWN button on the set and the Channel button **(9)** on the remote control for more than 1 second to appear the adjustment mode on the screen as shown in **Fig. 1-1**.

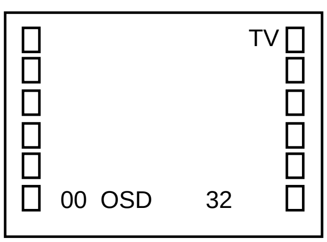


Fig. 1-1

2. Use the Channel UP/DOWN button or Channel button **(0-9)** on the remote control to select the options shown in **Fig. 1-2**.
3. Press the MENU button on the remote control to end the adjustments.

NO.	FUNCTION	NO.	FUNCTION
00	OSD H	18	CONTRAST MAX
01	CUT OFF	19	CONTRAST CENT
02	H. VCO	20	CONTRAST MIN
03	H. PHASE	21	COLOR MAX
04	AFC GAIN	22	COLOR CENTER
05	V. SHIFT	23	COLOR MIN
06	H. SIZE	24	TINT
07	V. SIZE	25	SHARPNESS
08	V. LINERITY	26	CB DL
09	VS CORRECTION	27	CR DL
10	R DRIVE	28	CB PED
11	B DRIVE	29	CR PED
12	R CUT OFF	30	PARABOLA
13	G CUT OFF	31	CORNER
14	B CUT OFF	32	TRAPWZIUM
15	BRIGHT MAX	33	LEVEL
16	BRIGHT CENT	34	SEPARATION1
17	BRIGHT MIN	35	SEPARATION2

Fig. 1-2

2. BASIC ADJUSTMENTS

2-1: CONSTANT VOLTAGE

1. Place the set in AV MODE without signal.
2. Connect the digital voltmeter to the **TP003**.
3. Adjust the **VR502** until the digital voltmeter is 135 $\pm$ 0.5V.

2-2: CUT OFF

1. Place the set in Aging Test for more than 15 minutes.
2. Place the set in AV MODE without signal.
3. Using the remote control, set the brightness and contrast to normal position.
4. Activate the adjustment mode display of **Fig. 1-1** and press the channel button **(01)** on the remote control to select “CUT OFF”.
5. Adjust the **Screen Volume** until a dim raster is obtained.

2-3: WHITE BALANCE, WHITE BALANCE CS

NOTE: Adjust after performing CUT OFF adjustment.

1. Place the set in Aging Test for more than 15 minutes.
2. Receive the gray scale pattern from the Pattern Generator with Brust On.
3. Using the remote control, set the brightness and contrast to normal position.
4. Activate the adjustment mode display of **Fig. 1-1** and press the channel button **(12)** on the remote control to select “R. BIAS”.
5. Press the CH. UP/DOWN button on the remote control to select the “R. BIAS”, “G. BIAS”, “B. BIAS”, “B. DRIVE” or “R. DRIVE”.
6. Adjust the VOL. UP/DOWN button on the remote control to whiten the R. BIAS, G. BIAS, B. BIAS, B. DRIVE and R. DRIVE at each step tone sections equally.
7. Perform the above adjustments 5 and 6 until the white color is achieved.
8. Press the TV/VIDEO button on the remote control to set to the CS mode.
9. Receive the gray scale pattern from the Pattern Generat or with Brust On.
10. If the picture is too much green.Activate the adjustment mode display of **Fig. 1-1** and press the channel button **(28)** on the remote control to select “CB PED”.
11. Adjust the VOL. UP/DOWN button on the remote control to select the step up.
12. If the picture is too much red.Activate the adjustment mode display of **Fig. 1-1** and press the channel button **(29)** on the remote control to select “CR PED”.
13. Adjust the VOL. UP/DOWN button on the remote control to select the step down.

ELECTRICAL ADJUSTMENTS

2-4: COLOR CENT

1. Receive the color bar pattern. (RF Input)
2. Using the remote control, set the brightness, contrast, color and tint to normal position.
3. Connect the oscilloscope to **TP022**.
4. Activate the adjustment mode display of **Fig. 1-1** and press the channel button **(22)** on the remote control to select "COLOR CENT".
5. Adjust the VOLTS RANGE VARIABLE knob of the oscilloscope until the range between white 100% and 0% is set to 4 scales on the screen of the oscilloscope.
6. Press the VOL. UP/DOWN button on the remote control until the red color level is adjusted to 110 ± 10% of the white level. **(Refer to Fig. 2-1)**
7. Receive the video color bar pattern. (Audio Video Input)
8. Set to the AV mode. Then perform the above adjustments 2~6.
9. Press the TV/VIDEO button on the remote control to set to the CS mode. Then perform the above adjustments 2~4.
10. Press the VOL. UP/DOWN button on the remote control until the color step No. becomes "67".

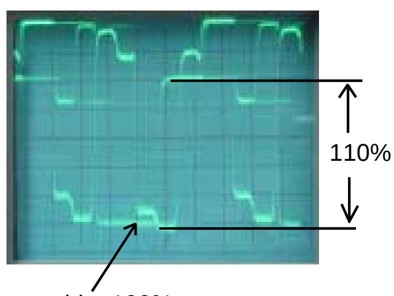


Fig. 2-1

2-5: TINT

1. Receive the color bar pattern. (RF Input)
2. Using the remote control, set the brightness, contrast, color and tint to normal position.
3. Connect the oscilloscope to **TP024**.
4. Activate the adjustment mode display of **Fig. 1-1** and press the channel button **(24)** on the remote control to select "TINT".
5. Press the VOL. UP/DOWN button on the remote control until the section "A" becomes as straight line. **(Refer to Fig. 2-2)**
6. Receive the video color bar pattern. (Audio Video Input)
7. Set to the AV mode. Then perform the above adjustments 2~5.
8. Press the TV/VIDEO button on the remote control to set to the CS mode. Then perform the above adjustments 2~4.
9. Press the VOL. UP/DOWN button on the remote control until the tint step No. becomes "55".

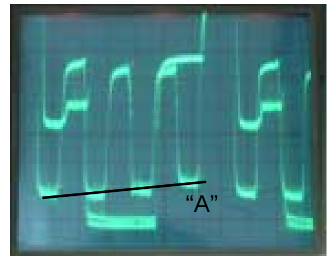


Fig. 2-2

2-6: FOCUS

1. Receive the monoscope pattern.
2. Turn the Focus Volume fully counterclockwise once.
3. Adjust the **Focus Volume** until picture is distinct.

2-7: VERTICAL POSITION

1. Receive the monoscope pattern.
2. Using the remote control, set the brightness and contrast to normal position.
3. Adjust the **VR401** until the horizontal line becomes fit to the notch of the shadow mask. **(Refer to Fig. 2-3)**

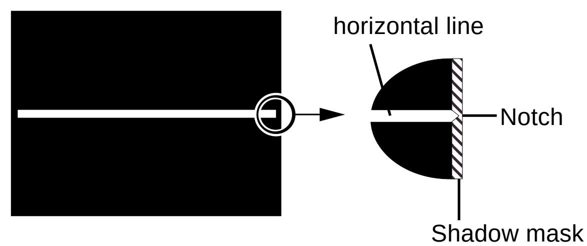


Fig. 2-3

2-8: VERTICAL SIZE

1. Receive the monoscope pattern.
2. Using the remote control, set the brightness and contrast to normal position.
3. Activate the adjustment mode display of **Fig. 1-1** and press the channel button **(07)** on the remote control to select "V. SIZE".
4. Press the VOL. UP/DOWN button on the remote control until the SHIFT quantity of the OVER SCAN on upside and downside becomes 9 ± 3%.

ELECTRICAL ADJUSTMENTS

2-9: VERTICAL LINEARITY

NOTE: Adjust after performing adjustments in section 2-8. After the adjustment of Vertical Linearity, reconfirm the Vertical Position and Vertical Size adjustments.

1. Receive the monoscope pattern.
2. Using the remote control, set the brightness, contrast, to normal position.
3. Activate the adjustment mode display of **Fig. 1-1** and press the channel button **(08)** on the remote control to select “V. LINEARITY”.
4. Press the VOL. UP/DOWN button on the remote control until the SHIFT quantity of the OVER SCAN on upside and downside becomes minimum.

2-10: HORIZONTAL POSITION

1. Receive the monoscope pattern.
2. Activate the adjustment mode display of **Fig. 1-1** and press the channel button **(03)** on the remote control to select "H.PHASE".
3. Press the VOL. UP/DOWN button on the remote control until the SHIFT quantity of the OVER SCAN on right and left becomes minimum.

2-11: HORIZONTAL SIZE

1. Receive the monoscope pattern.
2. Using the remote control, set the brightness and contrast to normal position.
3. Activate the adjustment mode display of **Fig. 1-1** and press the channel button **(06)** on the remote control to select “H. SIZE”.
4. Press the VOL. UP/DOWN button on the remote control adjust the H.SIZE becomes 10 ± 2%.

2-12: OSD POSITION

1. Activate the adjustment mode display of **Fig. 1-1**.
2. Press the VOL. UP/DOWN button on the remote control until the difference of A and B becomes minimum. **(Refer to Fig. 2-4)**

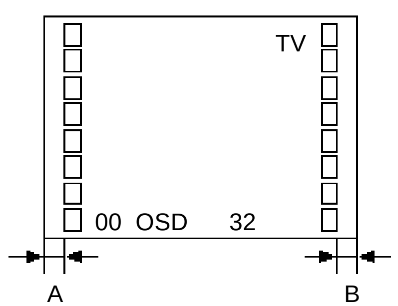


Fig. 2-4

2-13: BRIGHT CENT

1. Receive the monoscope pattern. (RF Input)
2. Using the remote control, set the brightness and contrast to normal position.
3. Activate the adjustment mode display of **Fig. 1-1** and press the channel button **(16)** on the remote control to select "BRI CENT".
4. Press the VOL. UP/DOWN button on the remote control until the white 10% is starting to be visible.
5. Receive the monoscope pattern. (Audio Video Input)
6. Press the TV/VIDEO button on the remote control to set to the AV mode. Then perform the above adjustments 2~4.
7. Press the TV/VIDEO button on the remote control to set to the CS mode.
8. Activate the adjustment mode display of **Fig. 1-1** and press the channel button **(16)** on the remote control to select "BRI CENT".
9. Press the VOL. UP/DOWN button on the remote control until the brightness step No. becomes "100".

2-14: CONTRAST MAX

1. Activate the adjustment mode display of **Fig. 1-1** and press the channel button **(18)** on the remote control to select “CONT. MAX”.
2. Press the VOL. UP/DOWN button on the remote control until the contrast step No. becomes “85”.
3. Receive a broadcast and check if the picture is normal.
4. Press the TV/VIDEO button on the remote control to set to the AV mode. Then perform the above adjustments 1~3.
5. Press the TV/VIDEO button on the remote control to set to the CS mode. Then perform the above adjustments 1~3.

2-15: PARABOLA/CORNER

1. Receive the cross hatch signal from the Pattern Generator.
2. Using the remote control, set the brightness and contrast to normal position.
3. Activate the adjustment mode display of **Fig. 1-1** and press the channel button **(30)** on the remote control to select “PARABOLA”.
4. Press the VOL. UP/DOWN button on the remote control until the right and left vertical lines are straight.
5. In the case the right and left vertical lines are not straigh, Please Activate the adjustment mode display of **Fig. 1-1** and press the channel button **(31)** on the remote control to select “CORNER”.
6. Press the VOL. UP/DOWN button on the remote control until the right and left vertical lines are straight.

2-16: TRAPEZIUM

1. Receive the cross hatch signal from the Pattern Generator.
2. Using the remote control, set the brightness and contrast to normal position.
3. Activate the adjustment mode display of **Fig. 1-1** and press the channel button **(32)** on the remote control to select “TRAPEZIUM”.
4. Press the VOL. UP/DOWN button on the remote control until the both vertical lines of the screen become paralled.

ELECTRICAL ADJUSTMENTS

2-17: SEPARATION 1, 2

1. Receive the stereo signal (L=2KHz, R=400Hz).
2. Connect the AC voltmeter to Audio Out Jack though stereo filter (L=400Hz, R=2KHz).
3. Activate the adjustment mode display of **Fig. 1-1** and press the channel button **(34)** on the remote control to select “SEP1”.
4. Press the VOL. UP/DOWN button on the remote control until the output of L-CH and R-CH become minimum.
5. Press the CH UP button once the set to “SEP2 mode.
6. Press the VOL. UP/DOWN button on the remote control until the output of L-CH and R-CH become minimum.
7. Press the CH DOWN button once the set to “SEP1” mode.
8. Repeat step 4 to step 7 several times.
   The output difference of the between with Filter and without Filter should be more than 25db for both L and R.

2-18: LEVEL

1. Connect the AC voltmeter to pin 6 of CP101.
2. Activate the adjustment mode display of **Fig. 1-1** and press the channel button (**33**) on the remote control to select “LEVEL”.
3. Press the VOL. UP/DOWN button on the remote control until the AC voltmeter is 75 ± 2mV.

2-19: HORIZONTAL PHASE

1. Receive the monoscope pattern.
2. Using the remote control, set the brightness and contrast to normal position.
3. Activate the adjustment mode display of **Fig. 1-1** and press the channel button **(03)** on the remote control to select “H.PHASE”.
4. Press the VOL. UP/DOWN button on the remote control until the SHIFT quantity of the OVER SCAN on right and left becomes minimum.

2-20: Confirmation of Fixed Value (Step No.)

Please check if the fixed values of the each adjustment items are set correctly referring below.

NO.	FUNCTION	RF	AV	CS
02	H.VCO	03	03	03
04	AFC GAIN	07	07	07
05	V.SHIFT	03	03	03
09	VS CORRECTION	37	37	37
15	BRI.MAX	165	165	165
17	BRI.MIN	70	70	70
19	CONT.CENT	64	64	64
20	CONT.MIN	20	20	20
21	COL.MAX	100	100	100
23	COL.MIN	00	00	00
25	SHARPNESS	40	40	40
26	CB DL	00	00	00
27	CR DL	00	00	00

ELECTRICAL ADJUSTMENTS

3. PURITY AND CONVERGENCE ADJUSTMENTS

NOTE

1. Turn the unit on and let it warm up for at least 30 minutes before performing the following adjustments.
2. Place the CRT surface facing east or west to reduce the terrestrial magnetism.
3. Turn ON the unit and demagnetize with a Degauss Coil.

3-1: STATIC CONVERGENCE (ROUGH ADJUSTMENT)

1. Tighten the screw for the magnet. Refer to the adjusted CRT for the position. **(Refer to Fig. 3-1)**
   If the deflection yoke and magnet are in one body, untighten the screw for the body.
2. Receive the green raster pattern from the color bar generator.
3. Slide the deflection yoke until it touches the funnel side of the CRT.
4. Adjust center of screen to green, with red and blue on the sides, using the pair of purity magnets.
5. Switch the color bar generator from the green raster pattern to the crosshatch pattern.
6. Combine red and blue of the 3 color crosshatch pattern on the center of the screen by adjusting the pair of 4 pole magnets.
7. Combine red/blue (magenta) and green by adjusting the pair of 6 pole magnets.
8. Adjust the crosshatch pattern to change to white by repeating steps 6 and 7.

3-2: PURITY

NOTE

Adjust after performing adjustments in section 3-1.

1. Receive the green raster pattern from color bar generator.
2. Adjust the pair of purity magnets to center the color on the screen.
   Adjust the pair of purity magnets so the color at the ends are equally wide.
3. Move the deflection yoke backward (to neck side) slowly, and stop it at the position when the whole screen is green.
4. Confirm red and blue color.
5. Adjust the slant of the deflection yoke while watching the screen, then tighten the fixing screw.

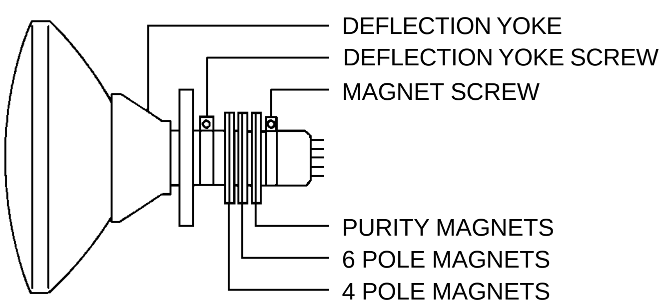


Fig. 3-1

3-3: STATIC CONVERGENCE

NOTE

Adjust after performing adjustments in section 3-2.

1. Receive the crosshatch pattern from the color bar generator.
2. Combine red and blue of the 3 color crosshatch pattern on the center of the screen by adjusting the pair of 4 pole magnets.
3. Combine red/blue (magenta) and green by adjusting the pair of 6 pole magnets.

3-4: DYNAMIC CONVERGENCE

NOTE

Adjust after performing adjustments in section 3-3.

1. Adjust the differences around the screen by moving the deflection yoke upward/downward and right/left.
   (Refer to Fig. 3-2-a)
2. Insert three wedges between the deflection yoke and CRT funnel to fix the deflection yoke.
   (Refer to Fig. 3-2-b)

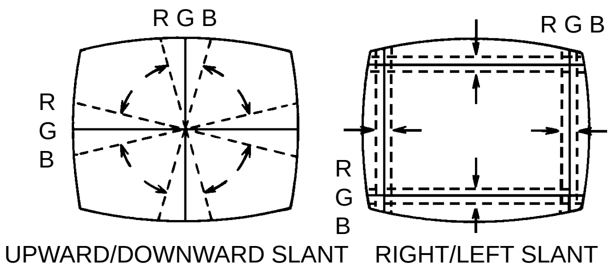


Fig. 3-2-a

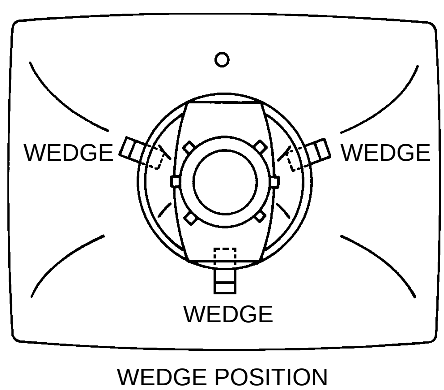
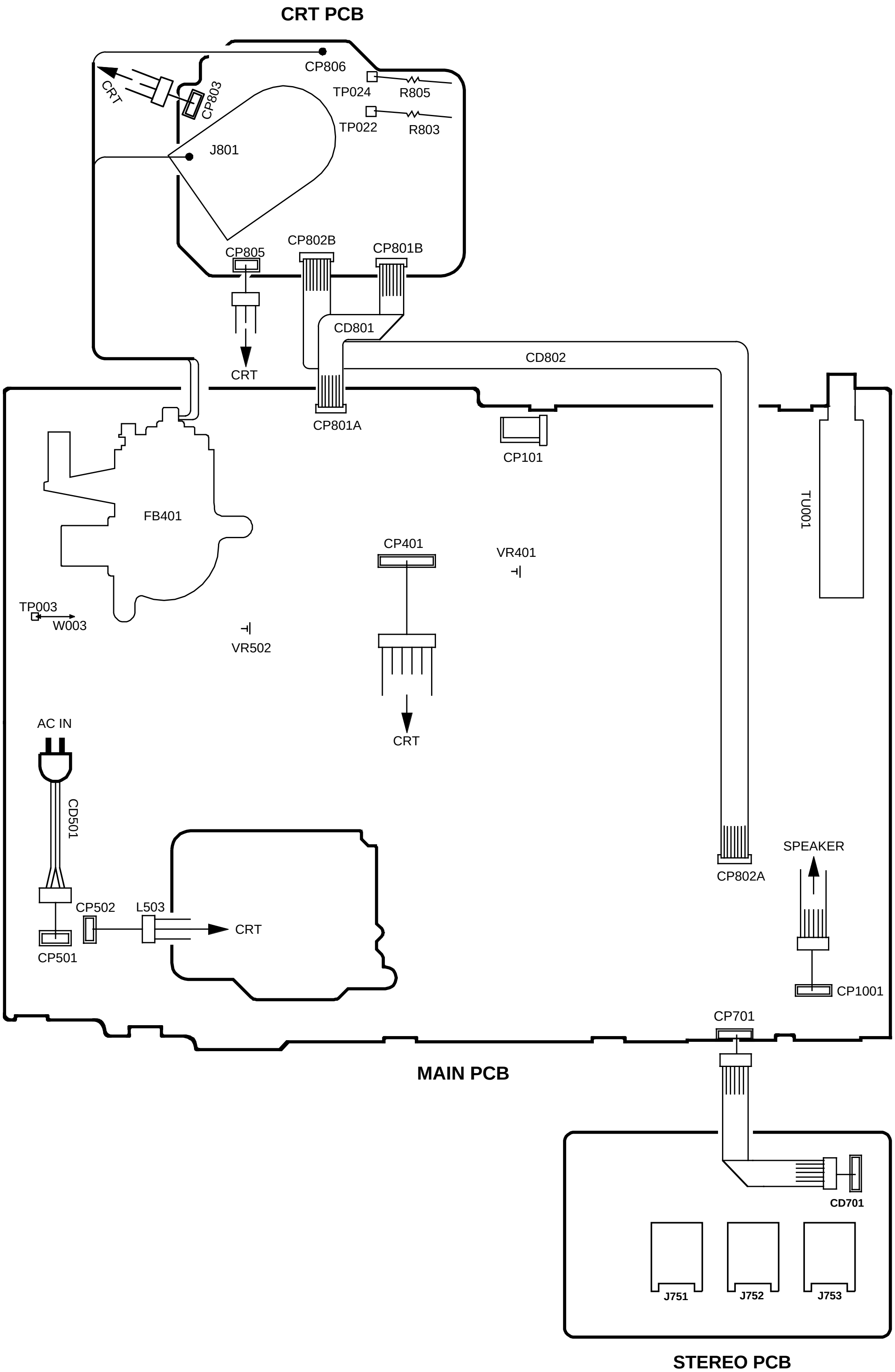


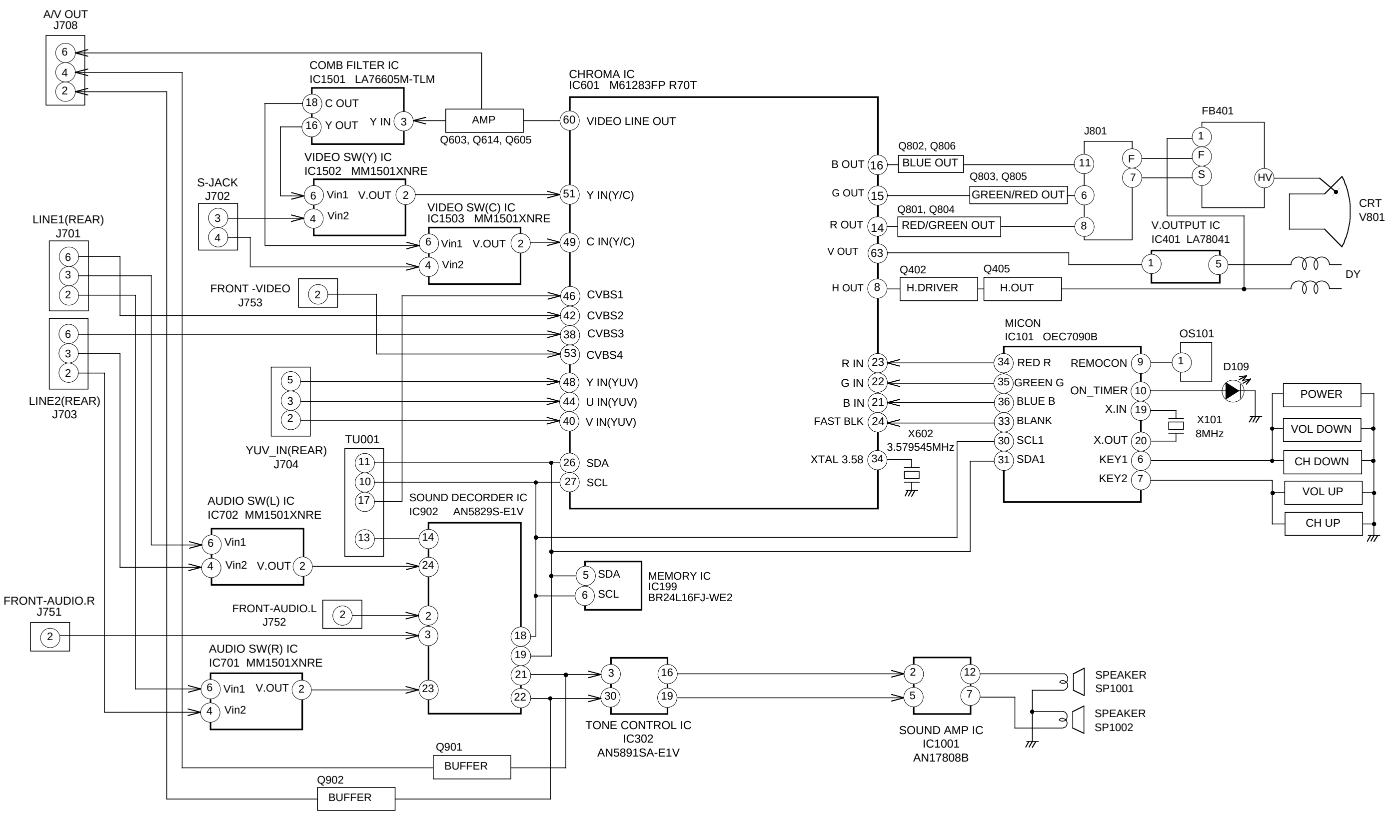
Fig. 3-2-b

ELECTRICAL ADJUSTMENTS

4. ELECTRICAL ADJUSTMENT PARTS LOCATION GUIDE (WIRING CONNECTION)



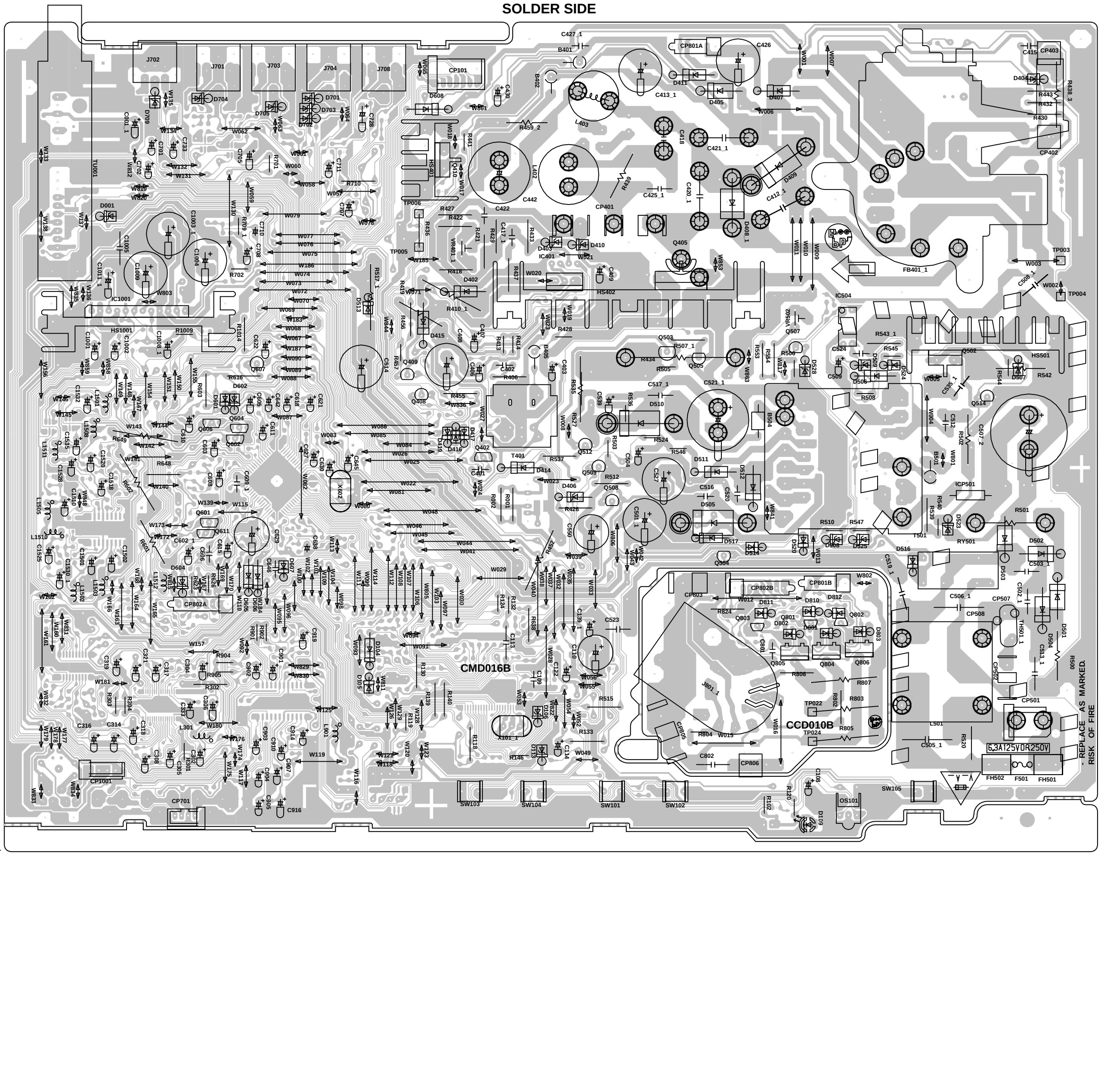
BLOCK DIAGRAM



PRINTED CIRCUIT BOARDS

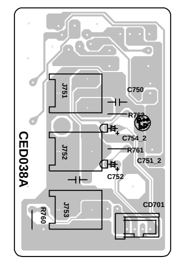
MAIN/CRT (INSERTED PARTS)

SOLDER SIDE



STEREO JACK (INSERTED PARTS)

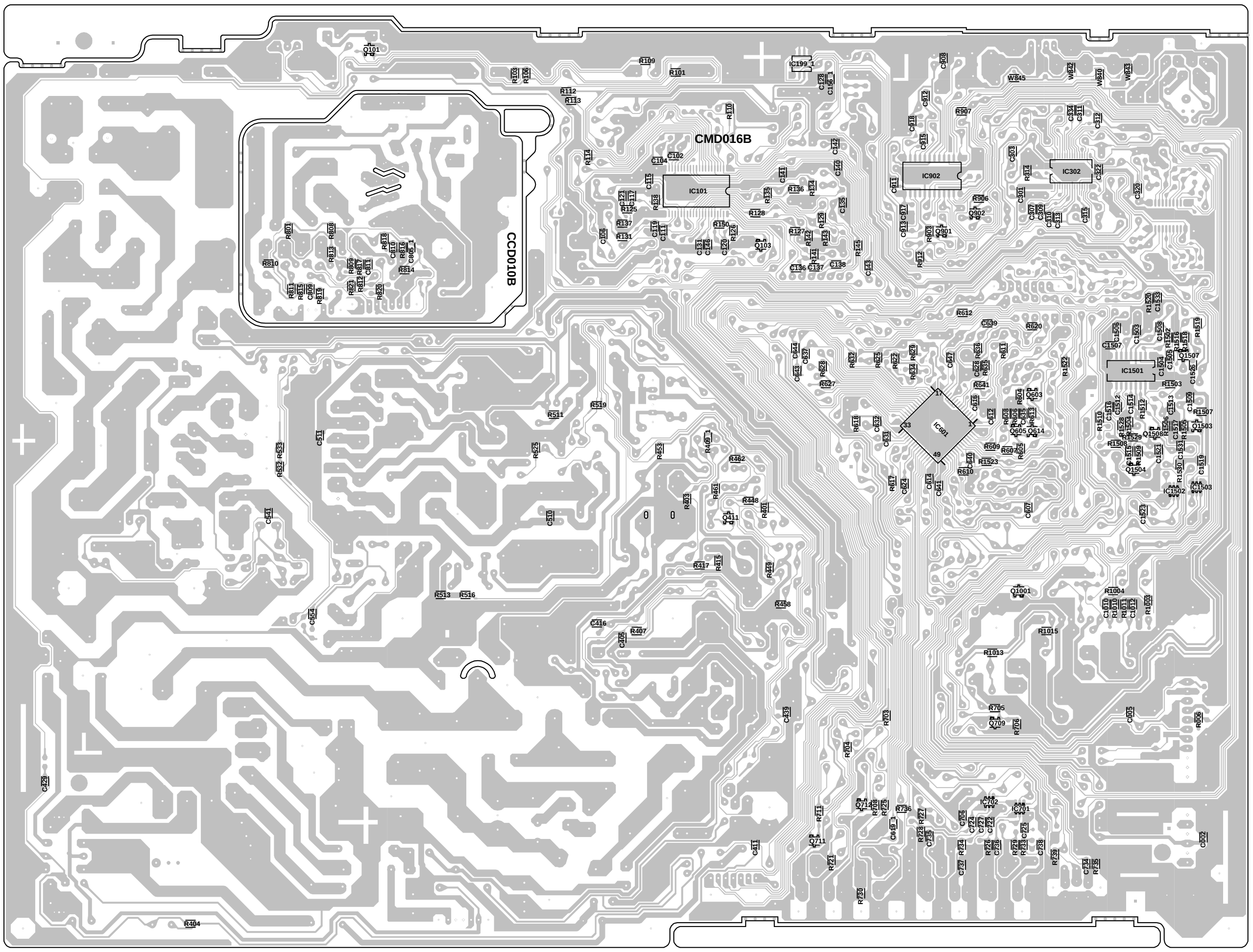
SOLDER SIDE



PRINTED CIRCUIT BOARDS

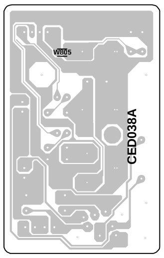
MAIN/CRT (CHIP MOUNTED PARTS)

SOLDER SIDE



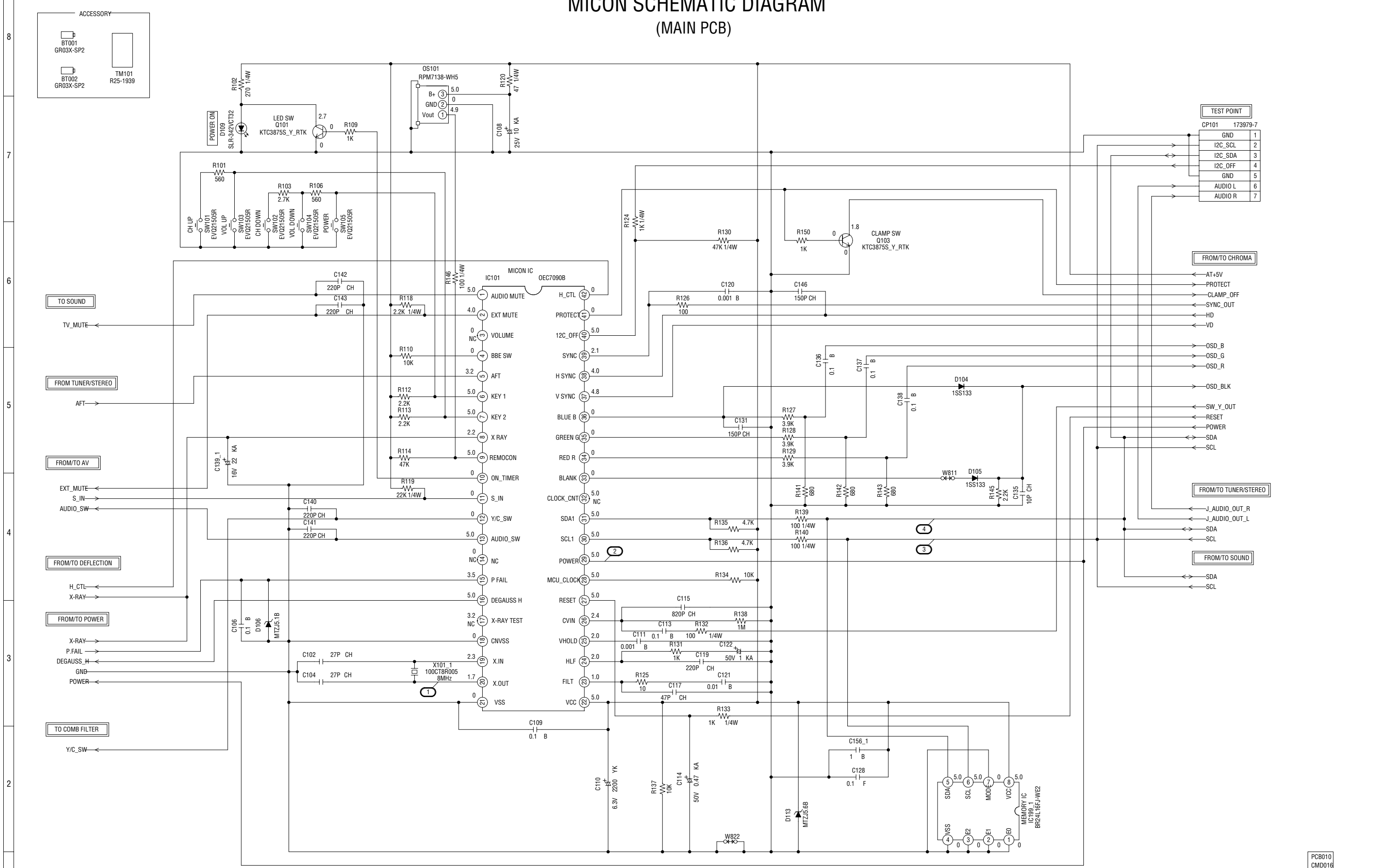
STEREO JACK (CHIP MOUNTED PARTS)

SOLDER SIDE



MICON SCHEMATIC DIAGRAM

(MAIN PCB)



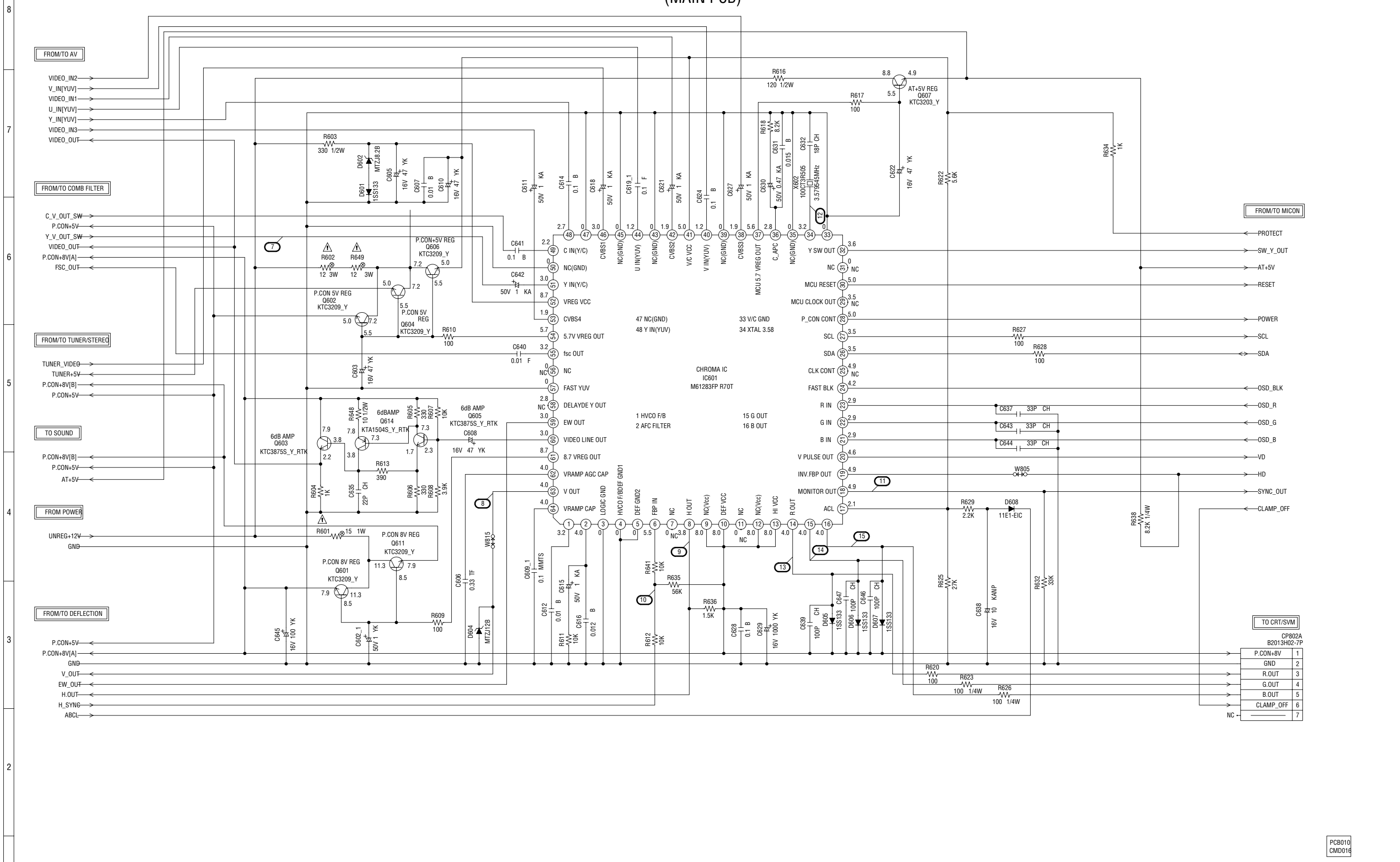
NOTE: THIS SCHEMATIC DIAGRAM IS THE LATEST AT THE TIME OF PRINTING AND SUBJECT TO CHANGE WITHOUT NOTICE.

NOTE: THE DC VOLTAGE AT EACH PART WAS MEASURED WITH THE DIGITAL TESTER WHEN THE COLOR BROADCAST WAS RECEIVED IN GOOD CONDITION AND PICTURE IS NORMAL.

G-1 G-2

CHROMA SCHEMATIC DIAGRAM

(MAIN PCB)



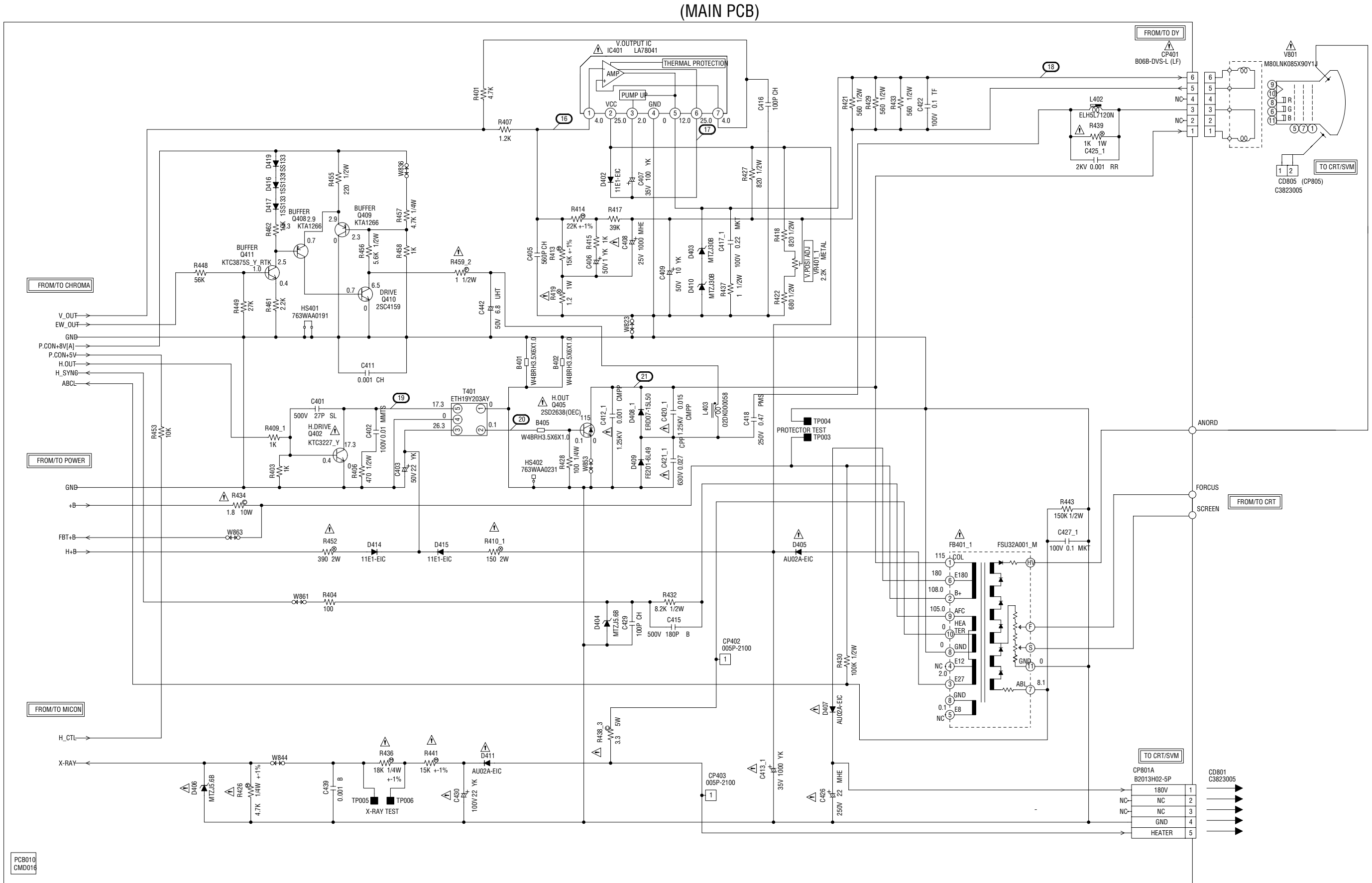
NOTE: THIS SCHEMATIC DIAGRAM IS THE LATEST AT THE TIME OF PRINTING AND SUBJECT TO CHANGE WITHOUT NOTICE.

NOTE: THE DC VOLTAGE AT EACH PART WAS MEASURED WITH THE DIGITAL TESTER WHEN THE COLOR BROADCAST WAS RECEIVED IN GOOD CONDITION AND PICTURE IS NORMAL.

ATTENTION: LES PIECES REPAREES PAR UN ⚠ ETANT DANGEREUSES AN POINT DE VUE SECURITE N'UTILISER QUE CELLS DECRITES DANS LA NOMENCLATURE DES PIECES.

CAUTION: SINCE THESE PARTS MARKED BY ⚠ ARE CRITICAL FOR SAFETY,USE ONES DESCRIBED IN PARTS LIST ONLY.

DEFLECTION SCHEMATIC DIAGRAM
(MAIN PCB)



NOTE: THIS SCHEMATIC DIAGRAM IS THE LATEST AT THE TIME OF PRINTING AND SUBJECT TO CHANGE WITHOUT NOTICE.

NOTE: THE RESISTOR MARKED F IS FUSE RESISTOR. THE ALUMI ELECTROLYTIC CAPACITOR MARKED NP IS NON POLAR ONE.

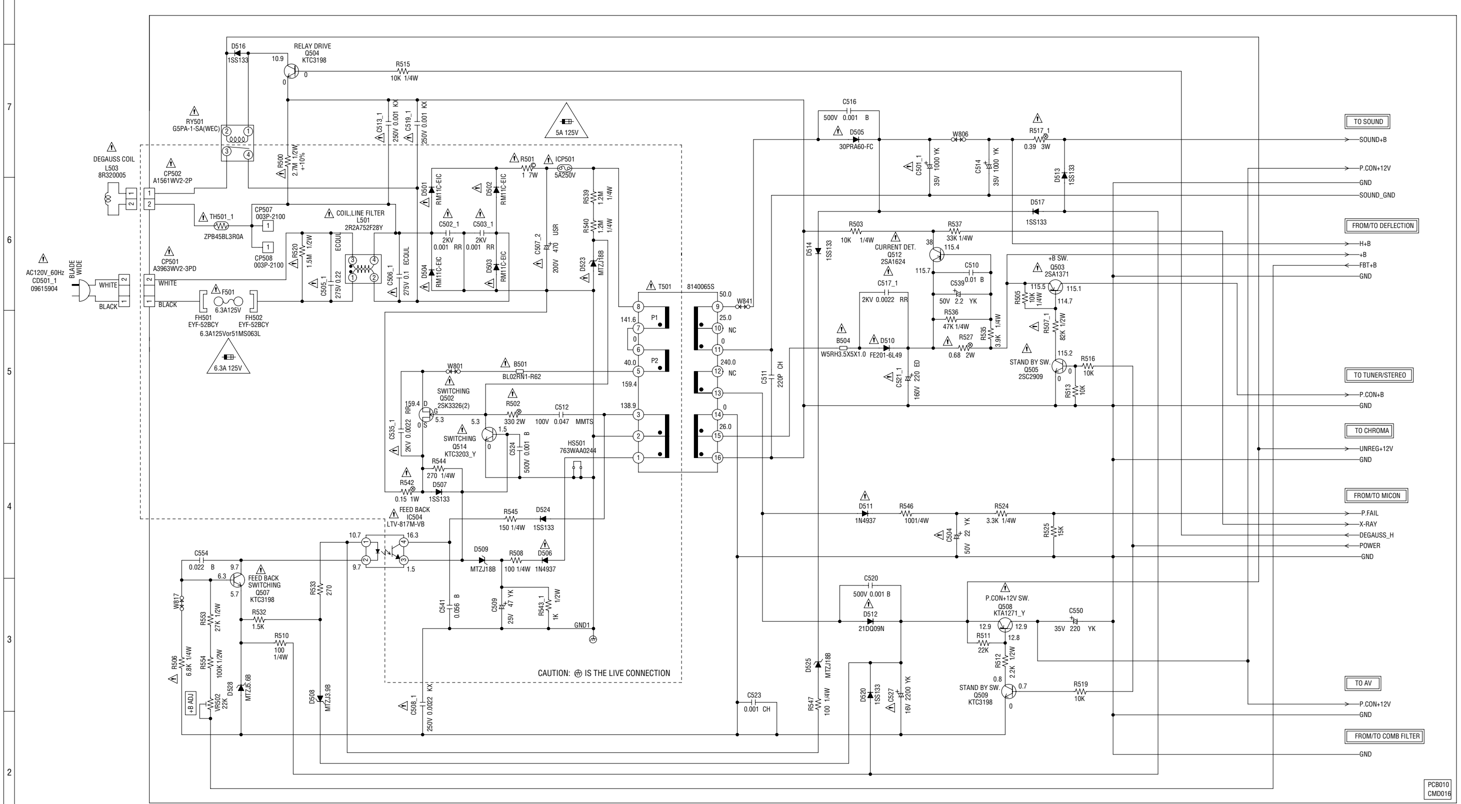
NOTE: THE DC VOLTAGE AT EACH PART WAS MEASURED WITH THE DIGITAL TESTER WHEN THE COLOR BROADCAST WAS RECEIVED IN GOOD CONDITION AND PICTURE IS NORMAL.

CAUTION: SINCE THESE PARTS MARKED BY ⚠ ARE CRITICAL FOR SAFETY, USE ONES DESCRIBED IN PARTS LIST ONLY.

ATTENTION: LES PIECES REPAREES PAR UN ⚠ ETANT DANGEREUSES AN POINT DE VUE SECURITE N'UTILISER QUE CELLS DECRITES DANS LA NOMENCLATURE DES PIECES.

POWER SCHEMATIC DIAGRAM

(MAIN PCB)



6.3A 125V 5A 125V

CAUTION: FOR CONTINUED PROTECTION AGAINST FIRE HAZARD. REPLACE ONLY WITH THE SAME TYPE FUSE 6.3A 125V(F501) AND 5A 250V(ICP501).

ATTENTION: POUR UNE PROTECTION CONTINUE LES RISQUES D'INCEIE N'UTILISER QUE DES FUSIBLE DE MEME TYPE 6.3A 125V(F501) ET 5A 250V(ICP501).

NOTE: THIS SCHEMATIC DIAGRAM IS THE LATEST AT THE TIME OF PRINTING AND SUBJECT TO CHANGE WITHOUT NOTICE.

NOTE: THE DC VOLTAGE AT EACH PART WAS MEASURED WITH THE DIGITAL TESTER WHEN THE COLOR BROADCAST WAS RECEIVED IN GOOD CONDITION AND PICTURE IS NORMAL.

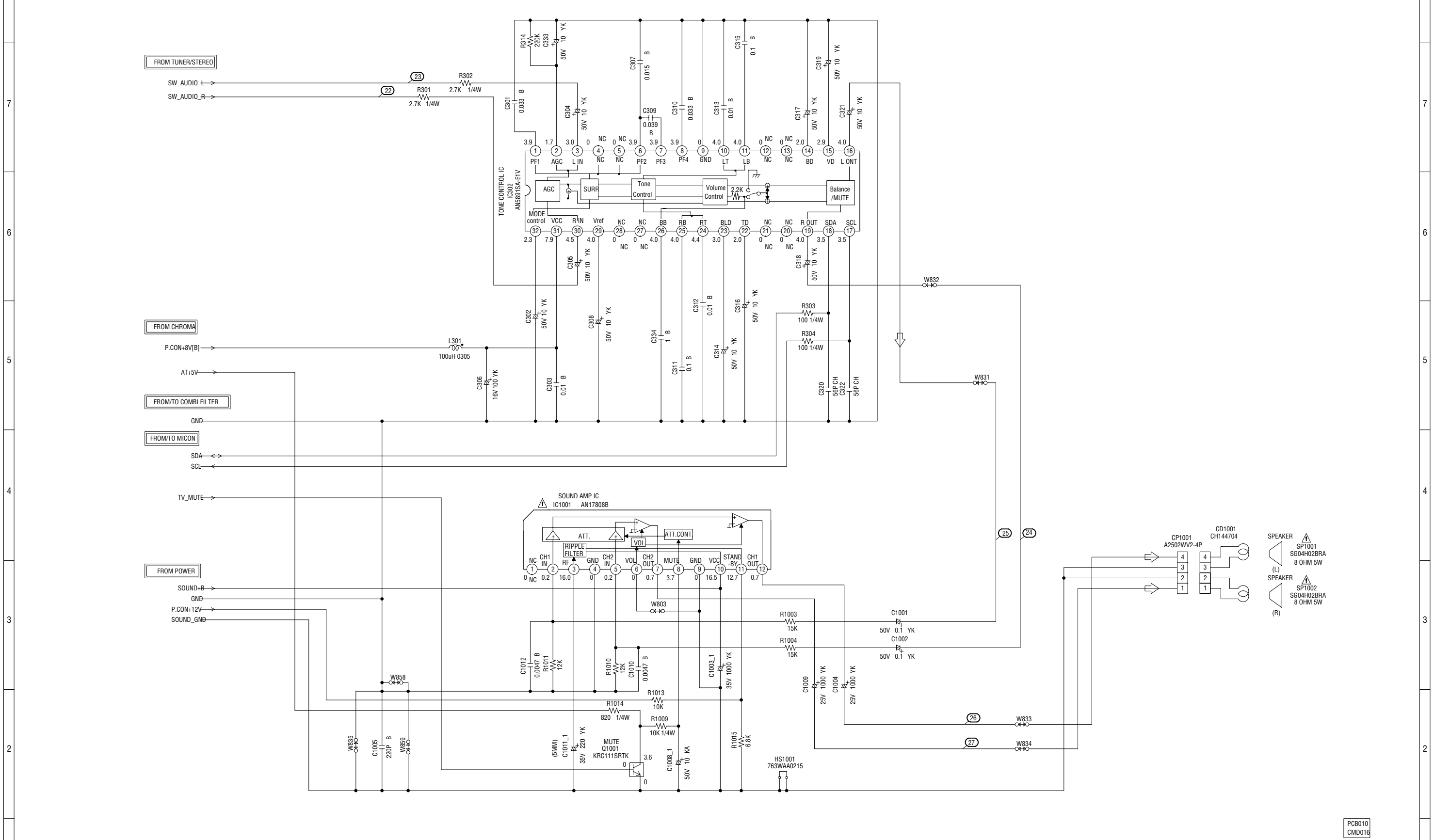
NOTE: THE RESISTOR MARKED F IS FUSE RESISTOR. THE ALUMI ELECTROLYTIC CAPACITOR MARKED NP IS NON POLAR ONE.

ATTENTION: LES PIECES REPAREES PAR UN ⚠ ETANT DANGEREUSES AN POINT DE VUE SECURITE N'UTILISER QUE CELLS DECRITES DANS LA NOMENCLATURE DES PIECES.

CAUTION: SINCE THESE PARTS MARKED BY ⚠ ARE CRITICAL FOR SAFETY, USE ONES DESCRIBED IN PARTS LIST ONLY.

SOUND SCHEMATIC DIAGRAM

(MAIN PCB)



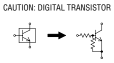
NOTE: THIS SCHEMATIC DIAGRAM IS THE LATEST AT THE TIME OF PRINTING AND SUBJECT TO CHANGE WITHOUT NOTICE.

NOTE: THE DC VOLTAGE AT EACH PART WAS MEASURED WITH THE DIGITAL TESTER WHEN THE COLOR BROADCAST WAS RECEIVED IN GOOD CONDITION AND PICTURE IS NORMAL.

ATTENTION: LES PIECES REPAREES PAR UN ⚠ ETANT DANGEREUSES AN POINT DE VUE SECURITE N'UTILISER QUE CELLS DECRITES DANS LA NOMENCLATURE DES PIECES.

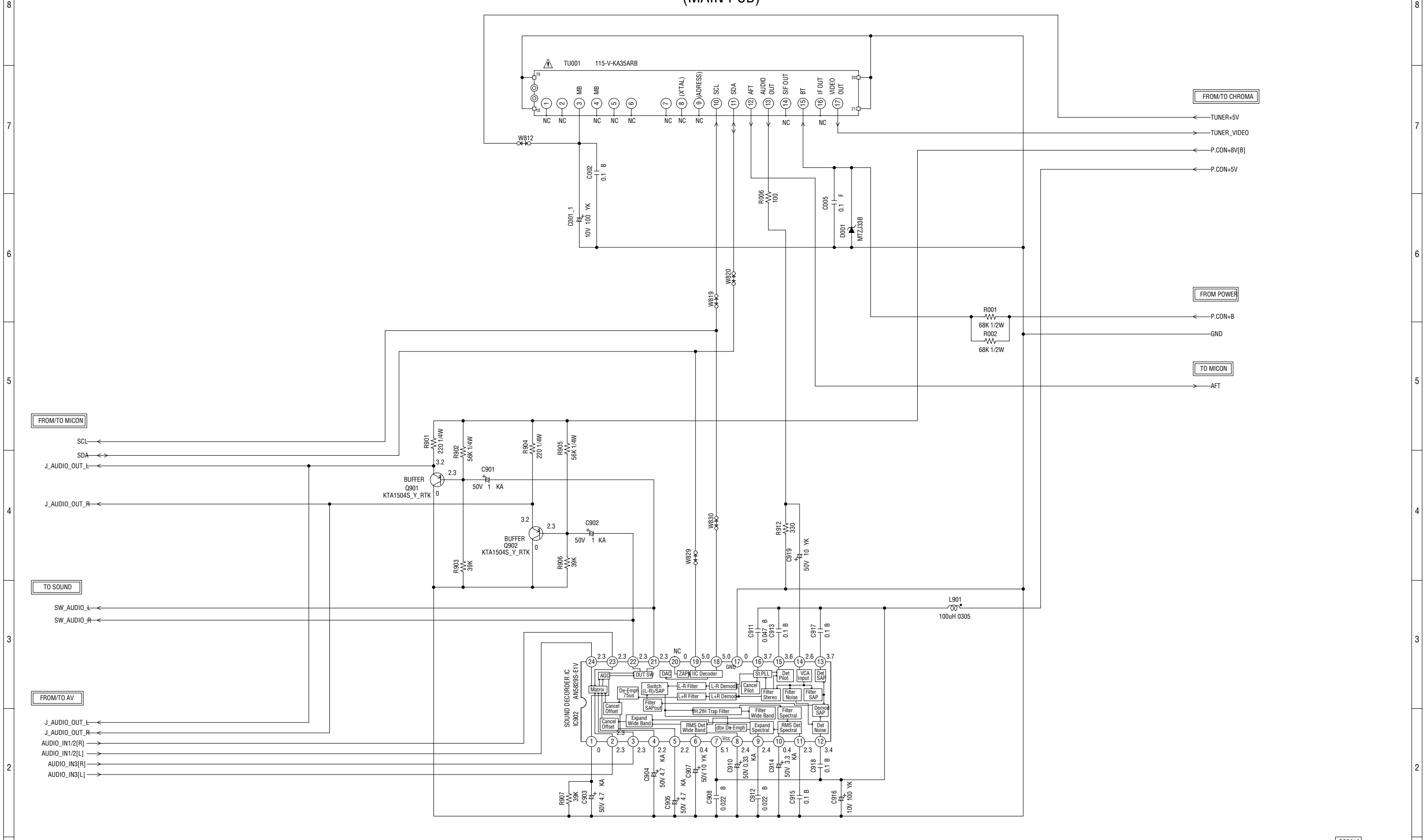
CAUTION: SINCE THESE PARTS MARKED BY ⚠ ARE CRITICAL FOR SAFETY, USE ONES DESCRIBED IN PARTS LIST ONLY.

CAUTION: DIGITAL TRANSISTOR



TUNER/STEREO SCHEMATIC DIAGRAM

(MAIN PCB)



NOTE: THIS SCHEMATIC DIAGRAM IS THE LATEST AT THE TIME OF PRINTING AND SUBJECT TO CHANGE WITHOUT NOTICE.

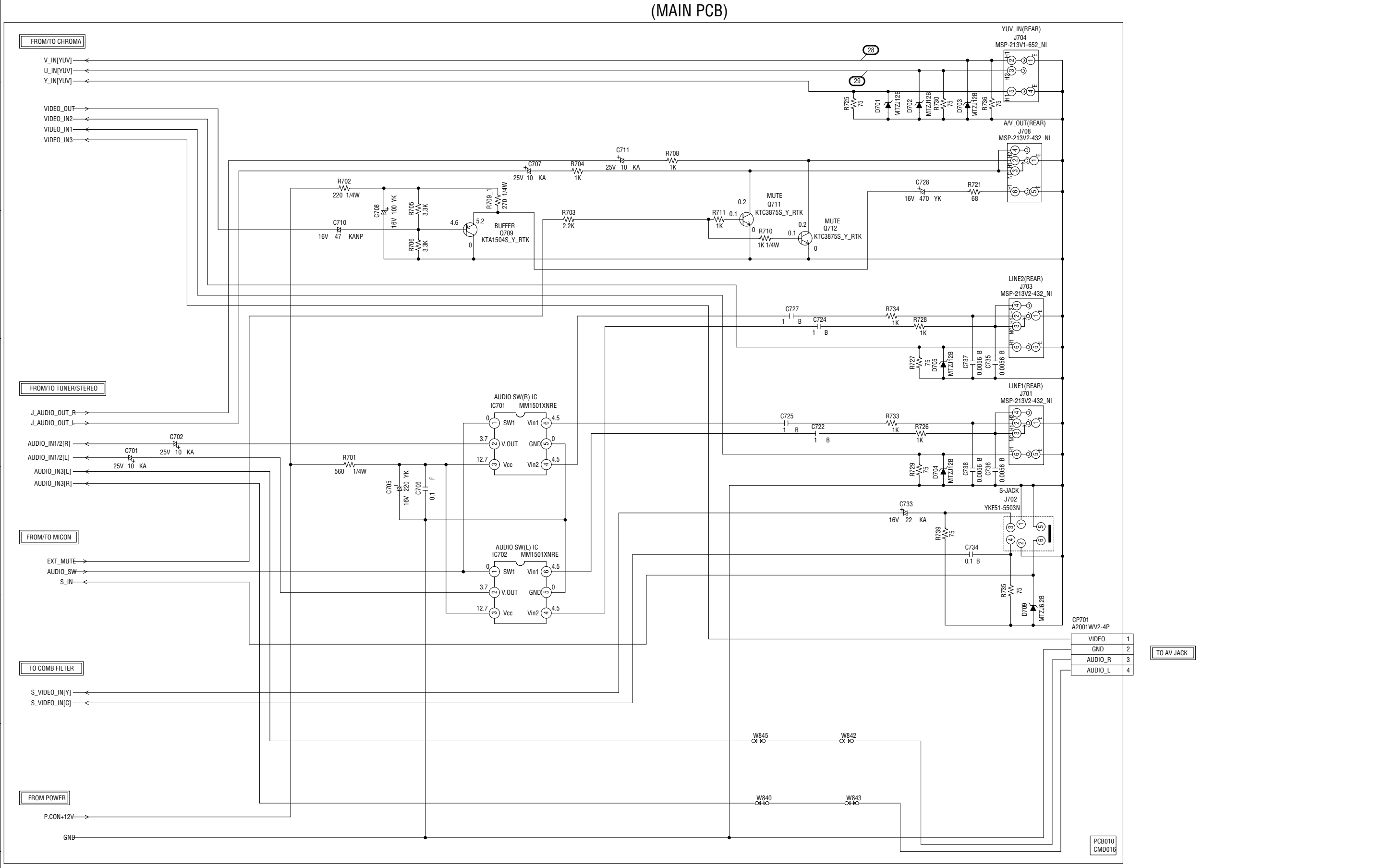
NOTE: THE DC VOLTAGE AT EACH PART WAS MEASURED WITH THE DIGITAL TESTER WHEN THE COLOR BROADCAST WAS RECEIVED IN GOOD CONDITION AND PICTURE IS NORMAL.

ATTENTION: LES PIECES REPAREES PAR UN ⚠ ETANT DANGEREUSES AN POINT DE VUE SECURITE N'UTILISER QUE CELLS DECRITES DANS LA NOMENCLATURE DES PIECES.

CAUTION: SINCE THESE PARTS MARKED BY ⚠ ARE CRITICAL FOR SAFETY, USE ONES DESCRIBED IN PARTS LIST ONLY.

AV SCHEMATIC DIAGRAM

(MAIN PCB)

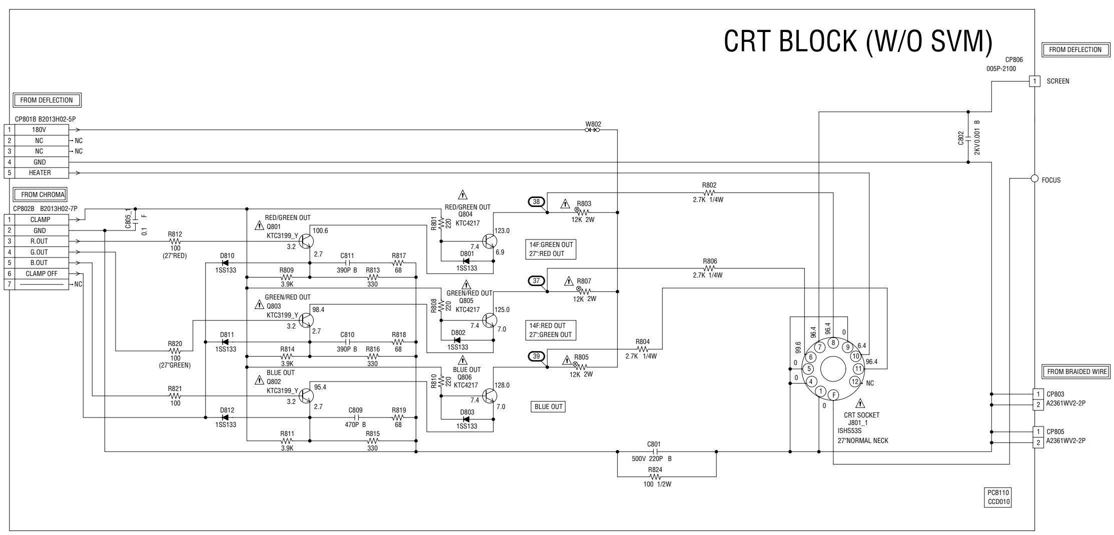


NOTE: THIS SCHEMATIC DIAGRAM IS THE LATEST AT THE TIME OF PRINTING AND SUBJECT TO CHANGE WITHOUT NOTICE.

NOTE: THE DC VOLTAGE AT EACH PART WAS MEASURED WITH THE DIGITAL TESTER WHEN THE COLOR BROADCAST WAS RECEIVED IN GOOD CONDITION AND PICTURE IS NORMAL.

CRT SCHEMATIC DIAGRAM

(CRT PCB)



NOTE: THIS SCHEMATIC DIAGRAM IS THE LATEST AT THE TIME OF PRINTING AND SUBJECT TO CHANGE WITHOUT NOTICE.

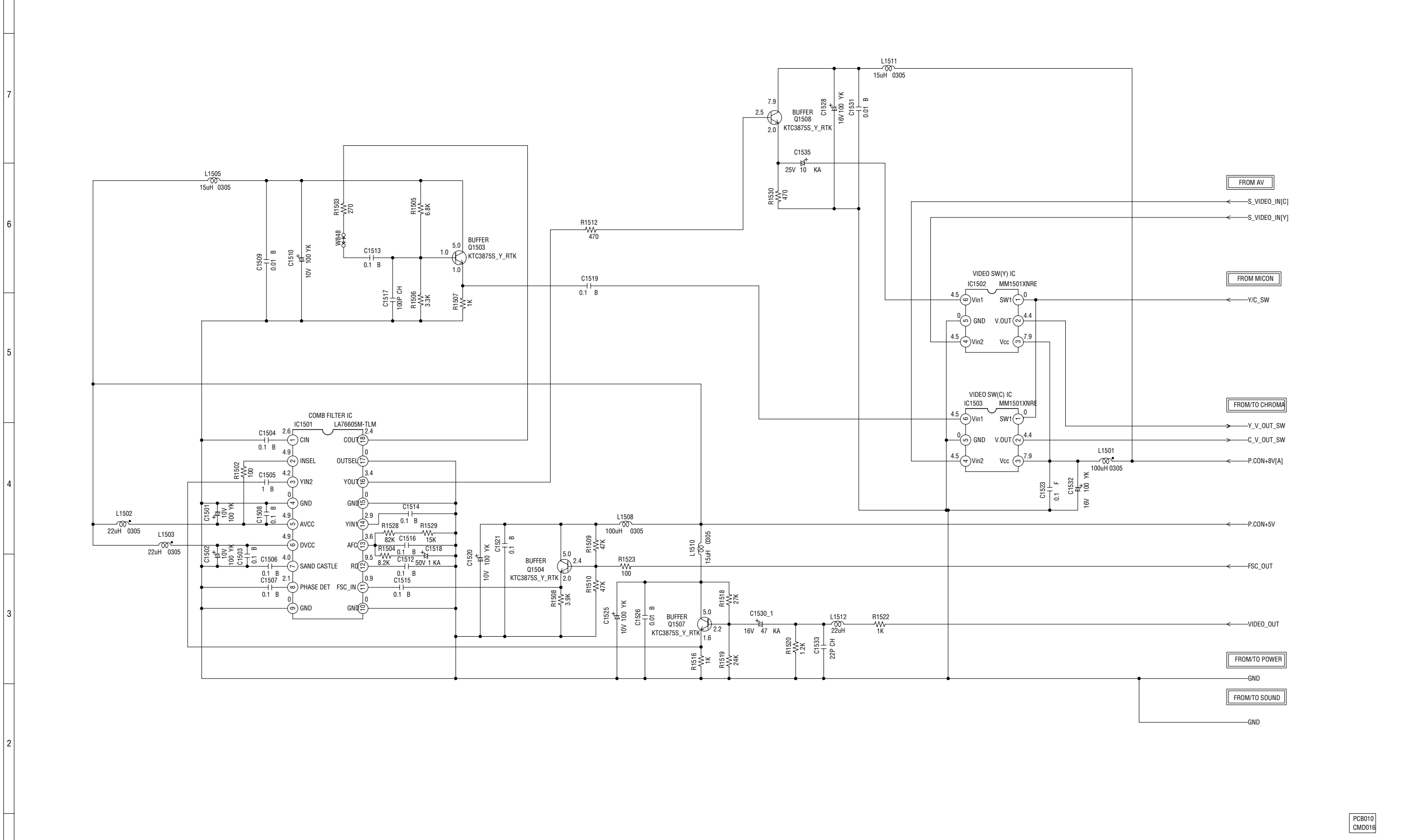
NOTE: THE DC VOLTAGE AT EACH PART WAS MEASURED WITH THE DIGITAL TESTER WHEN THE COLOR BROADCAST WAS RECEIVED IN GOOD CONDITION AND PICTURE IS NORMAL.

ATTENTION: LES PIECES REPAREES PAR UN ⚠ ETANT DANGEREUSES AN POINT DE VUE SECURITE N'UTILISER QUE CELLS DECRITES DANS LA NOMENCLATURE DES PIECES.

CAUTION: SINCE THESE PARTS MARKED BY ⚠ ARE CRITICAL FOR SAFETY, USE ONES DESCRIBED IN PARTS LIST ONLY.

COMB/FILTER SCHEMATIC DIAGRAM

(MAIN PCB)

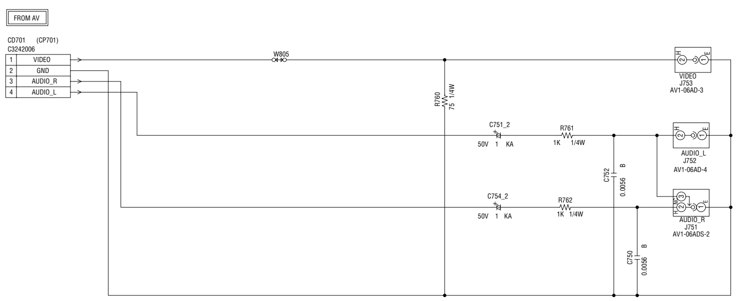


NOTE: THIS SCHEMATIC DIAGRAM IS THE LATEST AT THE TIME OF PRINTING AND SUBJECT TO CHANGE WITHOUT NOTICE.

NOTE: THE DC VOLTAGE AT EACH PART WAS MEASURED WITH THE DIGITAL TESTER WHEN THE COLOR BROADCAST WAS RECEIVED IN GOOD CONDITION AND PICTURE IS NORMAL.

AV JACK SCHEMATIC DIAGRAM

(AV JACK PCB)



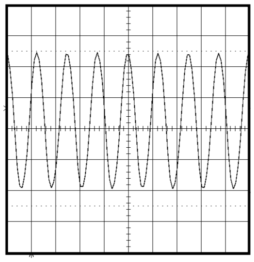
PCB280
CED038

NOTE: THIS SCHEMATIC DIAGRAM IS THE LATEST AT THE TIME OF PRINTING AND SUBJECT TO CHANGE WITHOUT NOTICE.

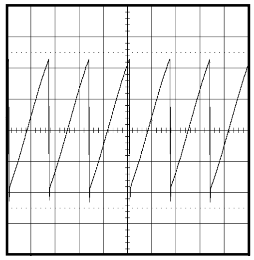
NOTE: THE DC VOLTAGE AT EACH PART WAS MEASURED WITH THE DIGITAL TESTER WHEN THE COLOR BROADCAST WAS RECEIVED IN GOOD CONDITION AND PICTURE IS NORMAL.

WAVEFORMS

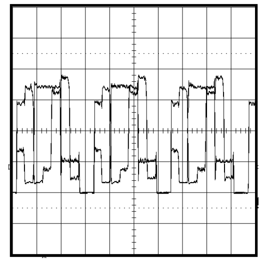
MICON



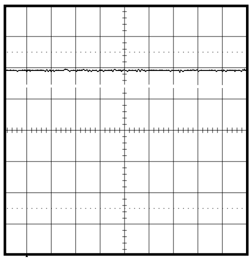
① 1V 0.1µs/div



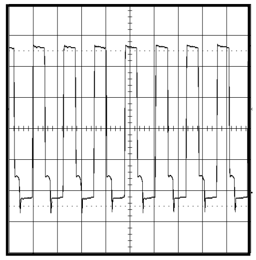
⑧ 0.5V 10ms/div



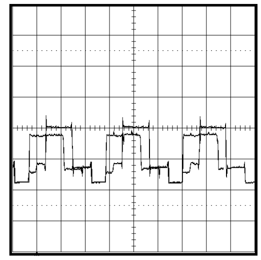
⑬ 1V 20µs/div



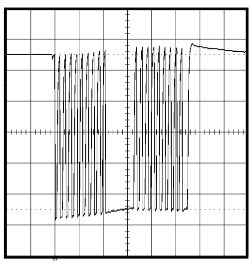
② 1V 1µs/div



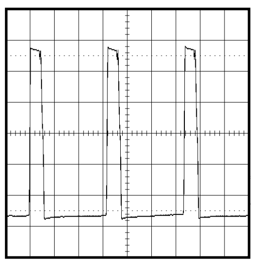
⑨ 1V 50µs/div



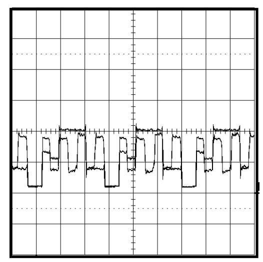
⑭ 2V 20µs/div



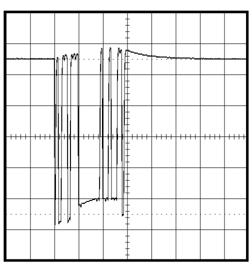
③ 1V 50µs/div



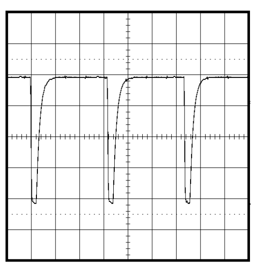
⑩ 2V 20µs/div



⑮ 2V 20µs/div

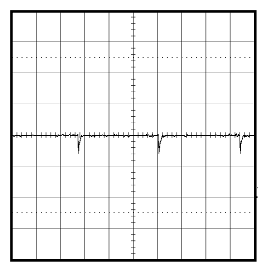


④ 1V 0.1ms/div



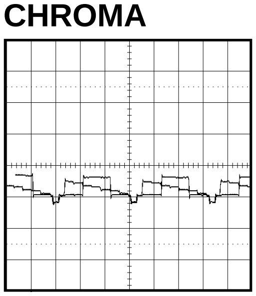
⑪ 0.5V 20µs/div

DEFLECTION

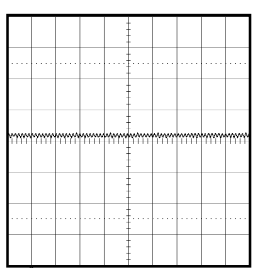


⑯ 2V 5ms/div

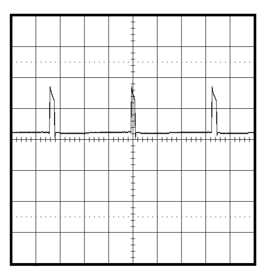
CHROMA



⑦ 1V 20µs/div



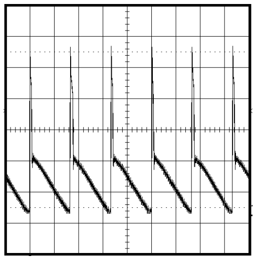
⑫ 1V 2µs/div



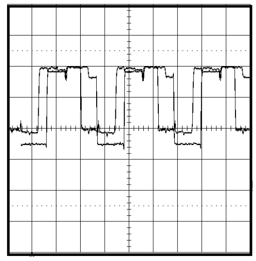
⑰ 20V 5ms/div

NOTE: The following waveforms were measured at the point of the corresponding balloon number in the schematic diagram.

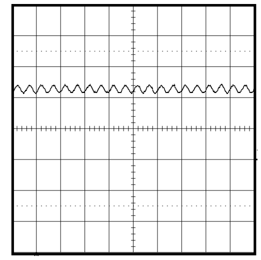
WAVEFORMS



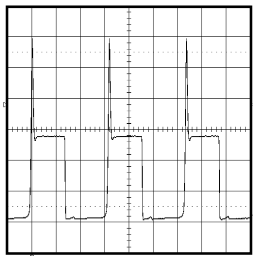
18 10V 10ms/div



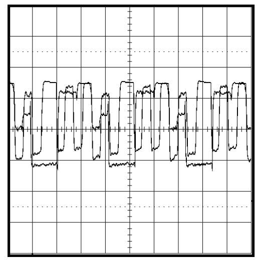
38 50V 20μs/div



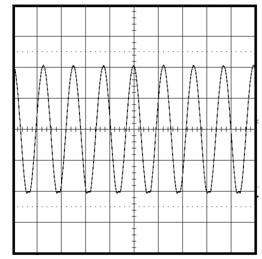
25 2V 5ms/div



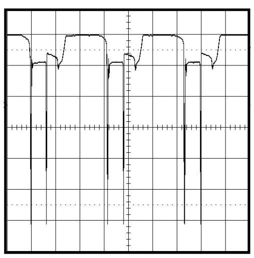
19 20V 20μs/div



39 50V 20μs/div

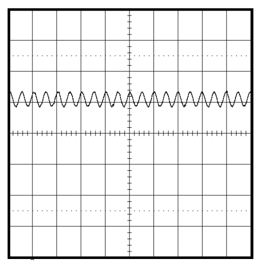


26 5V 2ms/div

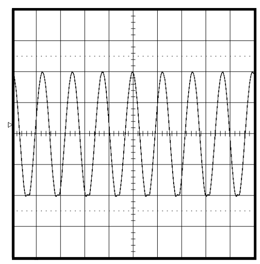


20 2V 20μs/div

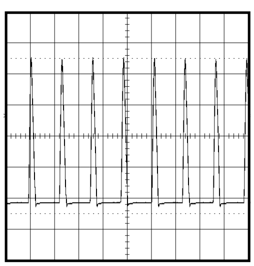
SOUND



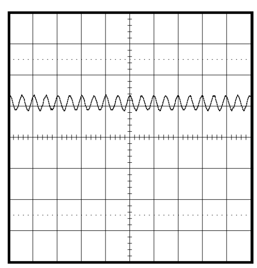
22 2V 5ms/div



27 5V 2ms/div

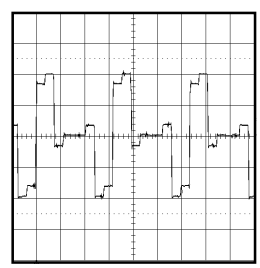


21 200V 50μs/div



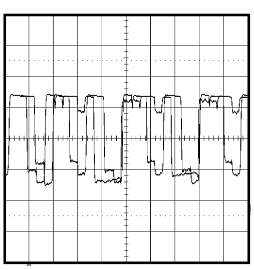
23 2V 5ms/div

AV

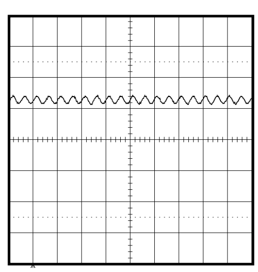


28 200mV 20μs/div

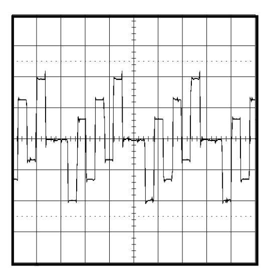
CRT



37 50V 20μs/div



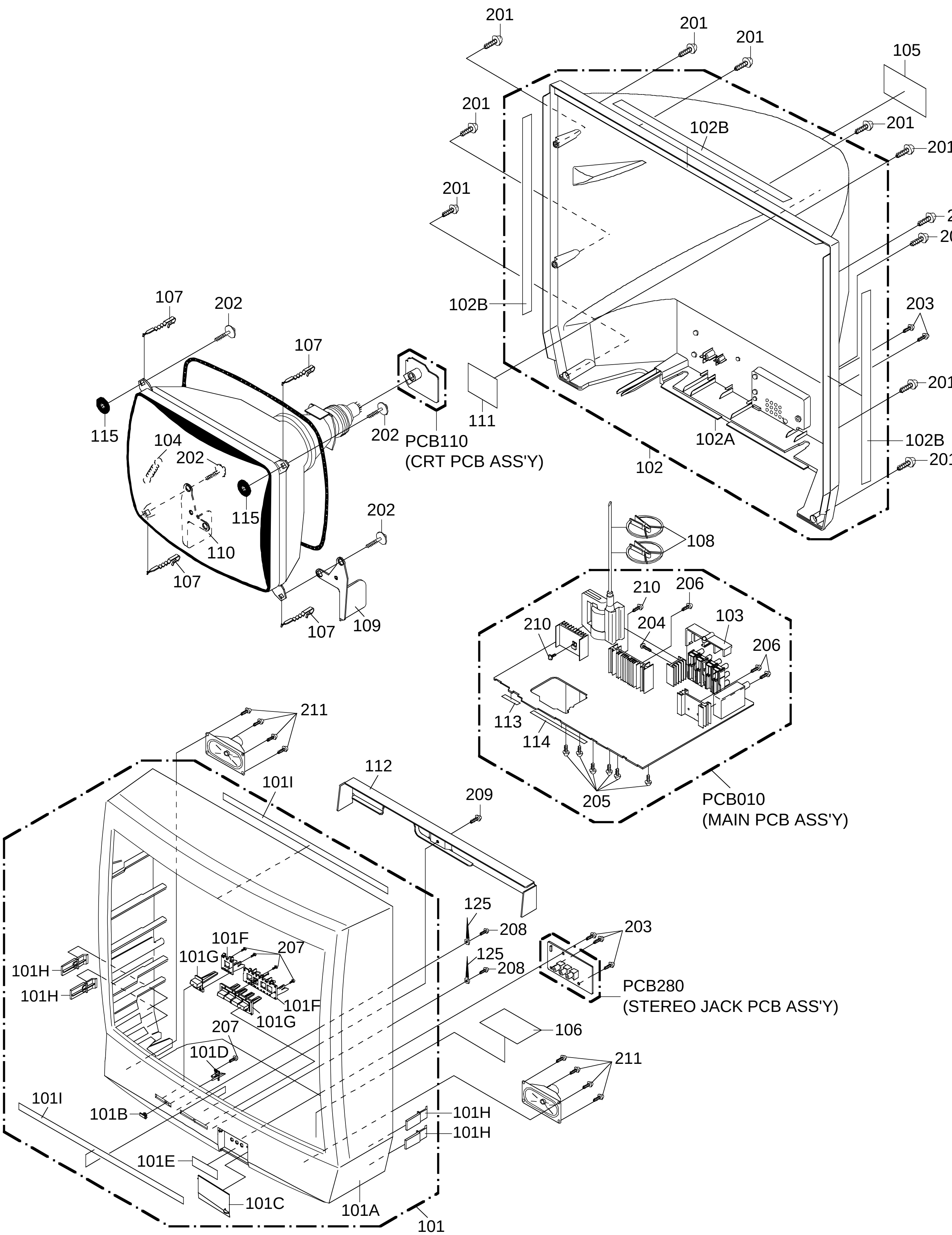
24 2V 5ms/div



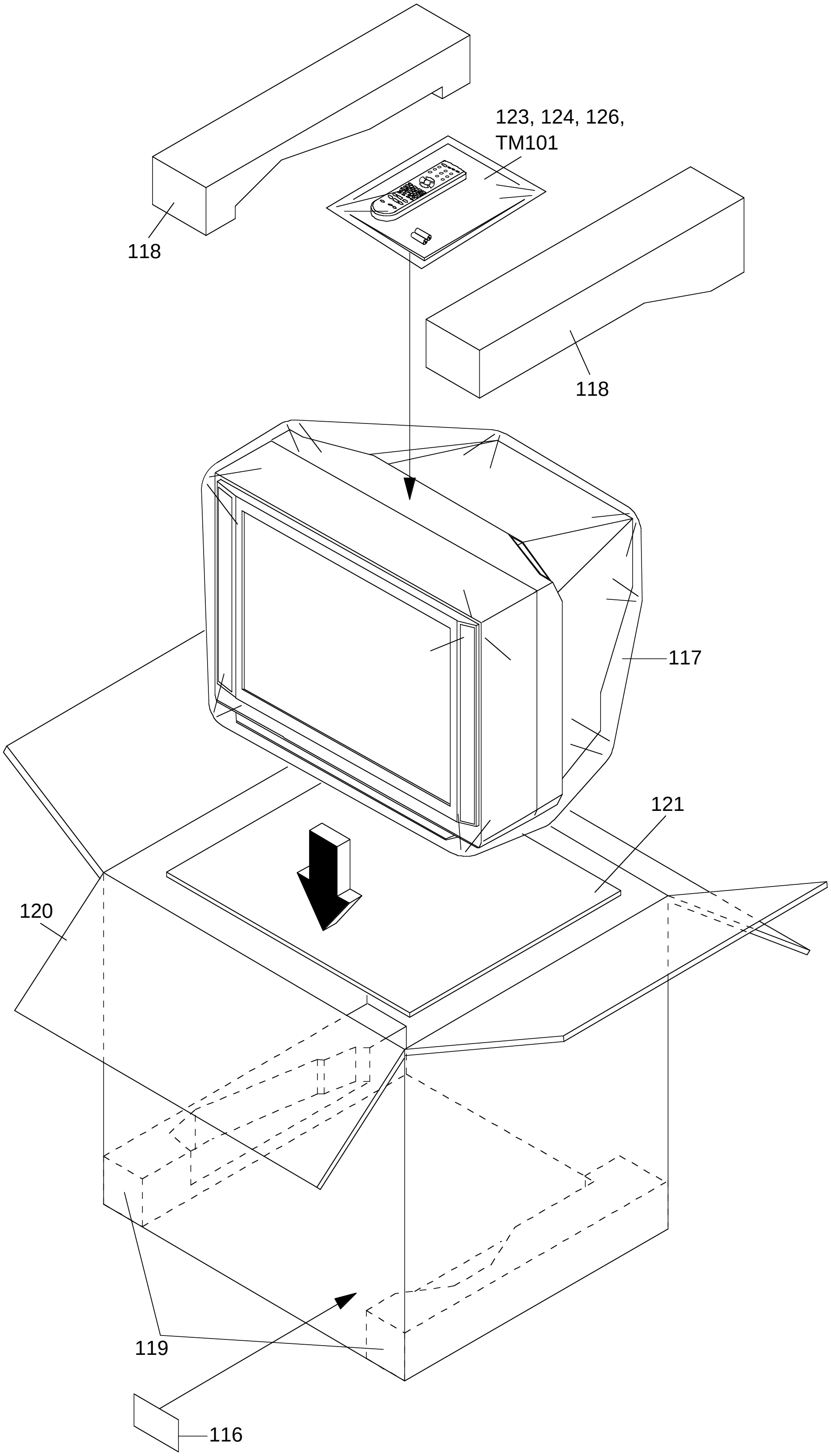
29 200mV 20μs/div

NOTE: The following waveforms were measured at the point of the corresponding balloon number in the schematic diagram.

MECHANICAL EXPLODED VIEW



MECHANICAL EXPLODED VIEW
(PACKING DIAGRAM)



MECHANICAL REPLACEMENT PARTS LIST

Location No.	TSB P/N	Reference No.	Description	
101	AE006023	7A701A304A	FRONT CABI ASS'Y	
101A	AE005749	701WPJC547	CABINET,FRONT	
101B	AE000626	711WPA0191	PLATE,FRONT	
101C	AE003182	712WPBA085	DOOR	
101D	AE000628	713WPA0288	GLASS,LED	
101E	AE003183	723000C520	AV LABEL	
101F	AE000634	735WPA0769	STOPPER,BUTTON	
101G	AE003184	735WPBA985	BUTTON,FRAME	
101H	AE000785	709WPA0024	CABINET HOLDER	
101I	AE003069	800WQ0A070	FELT SHEET	
102	AE007443	7A702A111A	BACK CABI ASS'Y	
102A	AE007444	702WPAA834	CABINET,BACK	
102B	AE005969	800WQ0A092	FELT SHEET	
103	AD301616	761WPA0263	HOLDER,JACK	
104	BZ710660	741WUA0021	SPRING,EARTH	
105	AE007445	722549A464	SHEET,RATING	
106	AE005650	723000C727	SHEET,CAUTION	
107	AD300768	762WPA0009	HOLDER,CRT WIRE	
108	BZ710260	899HV3T000	HOLDER,ANODE WIRE	
109	AE006089	752WSAA104	ANGLE,CRT(R)	
110	AE006090	752WSAA103	ANGLE,CRT (L)	
111	AE006091	726000A095	SHEET,CRT SERVICEMAN	
112	AE006092	752WSAA081	ANGLE,FRONT	
113	AE003190	800WQ0A067	FELT SHEET	
114	AE003069	800WQ0A070	FELT SHEET	
115	AD302158	800WR0A002	SHEET,CRT SUPPORT	
116	AE007446	723000C913	SHEET,BAR CODE	
117	AE006094	791WHAA118	FILM BAG	
118	AE000637	792WHA0464	PACKAGE,TOP	
119	AE000638	792WHA0465	PACKAGE,BOTTOM	
120	AE007447	793WCDC726	GIFT BOX	
121	AE006096	795WCDA015	PAD	
122	AE007448	A3N516H975	INSTRUCTION BOOK KIT	
123	AE007449	JA4ND200	POLYBAG,INSTRUCTION(RED CAUTION)	
124	AE007450	J3N51621A	INSTRUCTION BOOK	
125	BZ710039	8995034000	CORD CLIP UL CO.	
126	AE007451	J3N51617A	REGISTRATION CARD	
201	AE003522	8117540B0U	SCREW,TAP TITE(B0) TRUSS	4x20
202	AE004848	8141H60D5U	SCREW,TAP TITE(P) GW20	6x45
203	AE003528	8110630A0U	SCREW,TAP TITE(P) BRAZIER	3x10
204	AE003524	8109I30A0U	SCREW,TAP TITE(B) WH7	3x10
205	AE005917	810963080Q	SCREW,TAP TITE(B) BRAZIER	3x8
206	AE003531	810763080U	SCREW,TAP TITE(S) BRAZIER	3x8
207	AE005832	8110630A2U	SCREW,TAP TITE(P) BRAZIER	3x12
208	AE003529	811063080U	SCREW,TAP TITE(P) BRAZIER	3x8
209	AE006100	8110230B5U	SCREW,TAP TITE(P) BIND	3x25
210	AE005659	8109I3080U	SCREW,TAP TITE(B) WH7	3x8
211	AE006101	8110330A2U	SCREW,TAP TITE(P) FLAT	3x12

ELECTRICAL REPLACEMENT PARTS LIST

Location No.	TSB P/N	Reference No.	Description	
		RESISTORS		
⚠R410	AD301344	R3X18A151J	R,METAL OXIDE	150 OHM 2W
⚠R419	AD300784	R3X1811R2J	R,METAL OXIDE	1.2 OHM 1W
⚠R426	BZ210030	R4X5T4472F	R,METAL	4.7K OHM 1/4W
⚠R434	AD300421	R5X2CF1R8J	R,CEMENT	1.8 OHM 10W
⚠R436	BZ210023	R4X5T4183F	R,METAL	18K OHM 1/4W
⚠R438	AE006898	R5X50D3R3J	R,CEMENT	3.3 OHM 5W
⚠R439	BZ210003	R3K181102J	R,METAL OXIDE	1K OHM 1W
⚠R441	BZ210231	R4X5T6153F	R,METAL	15K OHM 1/6W
⚠R452	AD301385	R3X18A391J	R,METAL OXIDE	390 OHM 2W
⚠R459	AD301595	R65582010J	R,FUSE	1 OHM 1/2W
⚠R500	BZ210080	R0G3K2275K	RC	2.7M OHM 1/2W
⚠R501	AD301596	R5X2AE010J	R,CEMENT	1 OHM 7W
⚠R502	BZ210249	R3X28A331J	R,METAL OXIDE	330 OHM 2W
⚠R506	BZ210162	R002T4682J	RC	6.8K OHM 1/4W
⚠R507	AE000484	R002T2823J	RC	82K OHM 1/2W
⚠R517	AD302108	R3X28BR39J	R,METAL OXIDE	0.39 OHM 3W
⚠R520	BZ210206	R002T2155J	RC	1.5M OHM 1/2W
⚠R527	BZ210149	R3X18AR68J	R,METAL OXIDE	0.68 OHM 2W
⚠R542	BZ210248	R3X181R15J	R,METAL OXIDE	0.15 OHM 1W
⚠R601	AE006340	R3X181150J	R,METAL OXIDE	15 OHM 1W
⚠R602	AD301975	R3X28B120J	R,METAL OXIDE	12 OHM 3W
⚠R649	AD301975	R3X28B120J	R,METAL OXIDE	12 OHM 3W
⚠R803	BZ210050	R3X18A123J	R,METAL OXIDE	12K OHM 2W
⚠R805	BZ210050	R3X18A123J	R,METAL OXIDE	12K OHM 2W
⚠R807	BZ210050	R3X18A123J	R,METAL OXIDE	12K OHM 2W
		CAPACITORS		
⚠C408	BZ110032	E5EZF3102M	CE	1000 UF 25V
⚠C412	AD301390	P4N8FJ102H	CMPP	0.001 UF 1.25KV
⚠C413	AD301977	E0ELF4102M	CE	1000 UF 35V
C418	BZ210173	P4J7F3474J	CMPP	0.47 UF 250V PMS
⚠C420	AD300723	P4N8FJ153H	CMPP	0.015 UF 1.25KV
⚠C421	BZ110236	P3N1F5273J	CPP	0.027 UF 630V
C425	BZ110202	C0PLRR713K	CC	0.001 UF 2KV R
⚠C426	BZ110225	E5EZFD220M	CE	22 UF 250V
⚠C430	BZ110195	E02LU8220M	CE	22 UF 100V
C442	AE006084	E736F56R8M	CE	6.8 UF 50V
⚠C501	AD300067	E02LF4102M	CE	1000 UF 35V
⚠C502	BZ110202	C0PLRR713K	CC	0.001 UF 2KV R
⚠C503	BZ110202	C0PLRR713K	CC	0.001 UF 2KV R
⚠C504	BZ110205	E02LU5220M	CE	22 UF 50V
⚠C505	BZ110025	P2122B224M	CMP	0.22 UF 275V ECQUL
⚠C506	BZ110035	P2122B104M	CMP	0.1 UF 275V ECQUL
⚠C507	BZ110248	E52DGC471M	CE	5 470 UF 200V
⚠C508	BZ110222	CD39E0MH3M	CC	0.0022UF 250V
⚠C513	AD301026	CD39E0M13M	CC	0.001 UF 250V
C514	AD300067	E02LF4102M	CE	1000 UF 35V
⚠C517	BZ110201	C0PLRR7H3K	CC	0.0022 UF 2KV R
⚠C519	AD301026	CD39E0M13M	CC	0.001 UF 250V
⚠C521	AE006083	E61DFB221M	CE	220 UF 160V
⚠C527	BZ110119	E02LF2222M	CE	2200 UF 16V
⚠C535	BZ110201	C0PLRR7H3K	CC	0.0022 UF 2KV R
C802	BZ110247	C0JBB0713K	CC	0.001 UF 2KV B
C1003	AD300067	E02LF4102M	CE	1000 UF 35V
C1004	BZ110053	E02LF3102M	CE	1000 UF 25V
C1009	BZ110053	E02LF3102M	CE	1000 UF 25V
		DIODES		
D001	BZ410037	D97U03301B	DIODE,ZENER	MTZJ33B T-77
D104	BZ410006	D1VT001330	DIODE,SILICON	1SS133T-77
D105	BZ410006	D1VT001330	DIODE,SILICON	1SS133T-77
D106	BZ410020	D97U05R11B	DIODE,ZENER	MTZJ5.1B T-77
D109	BZ410054	0021721150	LED	SLR-342VCT32
D113	BZ410021	D97U05R61B	DIODE,ZENER	MTZJ5.6B T-77
D402	BZ410043	D2WT011E10	DIODE,SILICON	11E1-EIC
D403	BZ410019	D97U03001B	DIODE,ZENER	MTZJ30B T-77
D404	BZ410021	D97U05R61B	DIODE,ZENER	MTZJ5.6B T-77
⚠D405	BZ410063	D2WTAU02A0	DIODE,SILICON	AU02A-EIC
⚠D406	BZ410021	D97U05R61B	DIODE,ZENER	MTZJ5.6B T-77
⚠D407	BZ410063	D2WTAU02A0	DIODE,SILICON	AU02A-EIC
D408	AD302110	D2CF0715L0	DIODE,SILICON	ERD07-15L50
D409	AD301980	D2CF2016L0	DIODE,SILICON	FE201-6L49
D410	BZ410019	D97U03001B	DIODE,ZENER	MTZJ30B T-77

ELECTRICAL REPLACEMENT PARTS LIST

Location No.	TSB P/N	Reference No.	Description	
		DIODES		
⚠D411	BZ410063	D2WTAU02A0	DIODE,SILICON	AU02A-EIC
D414	BZ410043	D2WT011E10	DIODE,SILICON	11E1-EIC
D415	BZ410043	D2WT011E10	DIODE,SILICON	11E1-EIC
D416	BZ410006	D1VT001330	DIODE,SILICON	1SS133T-77
D417	BZ410006	D1VT001330	DIODE,SILICON	1SS133T-77
D419	BZ410006	D1VT001330	DIODE,SILICON	1SS133T-77
⚠D501	BZ410062	D2WTRM11C0	DIODE,SILICON	RM11C-EIC
⚠D502	BZ410062	D2WTRM11C0	DIODE,SILICON	RM11C-EIC
⚠D503	BZ410062	D2WTRM11C0	DIODE,SILICON	RM11C-EIC
⚠D504	BZ410062	D2WTRM11C0	DIODE,SILICON	RM11C-EIC
⚠D505	AE006082	D28F0PRA60	DIODE,RECTIFIER	30PRA60-FC
⚠D506	AD300731	D2WXN49370	DIODE,SILICON	1N4937
D507	BZ410006	D1VT001330	DIODE,SILICON	1SS133T-77
D508	BZ410064	D97U03R91B	DIODE,ZENER	MTZJ3.9B T-77
D509	AD300671	D97U01801B	DIODE,ZENER	MTZJ18B T-77
⚠D510	AD301980	D2CF2016L0	DIODE,SILICON	FE201-6L49
⚠D511	AD300731	D2WXN49370	DIODE,SILICON	1N4937
⚠D512	BZ410010	D28T21DQN9	DIODE,SCHOTTKY	21DQ09N-TA2B1
D513	BZ410006	D1VT001330	DIODE,SILICON	1SS133T-77
D514	BZ410006	D1VT001330	DIODE,SILICON	1SS133T-77
D516	BZ410006	D1VT001330	DIODE,SILICON	1SS133T-77
D517	BZ410006	D1VT001330	DIODE,SILICON	1SS133T-77
D520	BZ410006	D1VT001330	DIODE,SILICON	1SS133T-77
⚠D523	AD300671	D97U01801B	DIODE,ZENER	MTZJ18B T-77
D524	BZ410006	D1VT001330	DIODE,SILICON	1SS133T-77
D525	AD300671	D97U01801B	DIODE,ZENER	MTZJ18B T-77
D528	BZ410021	D97U05R61B	DIODE,ZENER	MTZJ5.6B T-77
D601	BZ410006	D1VT001330	DIODE,SILICON	1SS133T-77
D602	BZ410058	D97U08R21B	DIODE,ZENER	MTZJ8.2B T-77
D604	AD300070	D97U01201B	DIODE,ZENER	MTZJ12B T-77
D605	BZ410006	D1VT001330	DIODE,SILICON	1SS133T-77
D606	BZ410006	D1VT001330	DIODE,SILICON	1SS133T-77
D607	BZ410006	D1VT001330	DIODE,SILICON	1SS133T-77
D608	BZ410043	D2WT011E10	DIODE,SILICON	11E1-EIC
D701	AD300070	D97U01201B	DIODE,ZENER	MTZJ12B T-77
D702	AD300070	D97U01201B	DIODE,ZENER	MTZJ12B T-77
D703	AD300070	D97U01201B	DIODE,ZENER	MTZJ12B T-77
D704	AD300070	D97U01201B	DIODE,ZENER	MTZJ12B T-77
D705	AD300070	D97U01201B	DIODE,ZENER	MTZJ12B T-77
D709	BZ410066	D97U06R21B	DIODE,ZENER	MTZJ6.2B T-77
D801	BZ410006	D1VT001330	DIODE,SILICON	1SS133T-77
D802	BZ410006	D1VT001330	DIODE,SILICON	1SS133T-77
D803	BZ410006	D1VT001330	DIODE,SILICON	1SS133T-77
D810	BZ410006	D1VT001330	DIODE,SILICON	1SS133T-77
D811	BZ410006	D1VT001330	DIODE,SILICON	1SS133T-77
D812	BZ410006	D1VT001330	DIODE,SILICON	1SS133T-77
		ICS		
IC101	AE006067	I56F07090B	IC	OEC7090B
IC199	AE006079	A3N515H015	INIT DATA	BR24L16FJ-WE2
IC302	AD301983	I01FF58910	IC	AN5891SA-E1V
⚠IC401	BZ611117	I03TD80410	IC	LA78041
⚠IC504	BZ410088	0002E00610	PHOTO COUPLER	LTV-817M-VB
IC601	AE002803	I06FC1283A	IC	M61283FP R70T
IC701	AD301988	I0UF015010	IC	MM1501XNRE
IC702	AD301988	I0UF015010	IC	MM1501XNRE
IC902	BZ611068	I01FF58290	IC	AN5829S-E1V
⚠IC1001	AE003081	I0FSP7808B	IC	AN17808B
IC1501	AE003002	I03FE76605	IC	LA76605M-TLM
IC1502	AD301988	I0UF015010	IC	MM1501XNRE
IC1503	AD301988	I0UF015010	IC	MM1501XNRE
		TRANSISTORS		
Q101	BZ510109	TCAA3875SY	TRANSISTOR,SILICON	KTC3875S_Y_RTK
Q103	BZ510109	TCAA3875SY	TRANSISTOR,SILICON	KTC3875S_Y_RTK
⚠Q402	BZ510097	TCAT03227Y	TRANSISTOR,SILICON	KTC3227_Y-AT
⚠Q405	AD302136	TD50026380	TRANSISTOR,SILICON	2SD2638(OEC)
Q408	BZ510073	TAATA12660	TRANSISTOR,SILICON	KTA1266-AT(Y,GR)
Q409	BZ510073	TAATA12660	TRANSISTOR,SILICON	KTA1266-AT(Y,GR)
Q410	BZ510110	TC30041590	TRANSISTOR,SILICON	2SC4159(D,E)
Q411	BZ510109	TCAA3875SY	TRANSISTOR,SILICON	KTC3875S_Y_RTK
⚠Q502	BZ510098	T220033260	FET	2SK3326(2)
⚠Q503	BZ510005	TA3T1371A0	TRANSISTOR,SILICON	2SA1371(D,E)-AE

ELECTRICAL REPLACEMENT PARTS LIST

Location No.	TSB P/N	Reference No.	Description	
		TRANSISTORS		
Q504	BZ510069	TCATC31980	TRANSISTOR,SILICON	KTC3198-AT(Y,GR)
⚠ Q505	BZ510011	TC3T029090	TRANSISTOR,SILICON	2SC2909(S,T)-AA
⚠ Q507	BZ510069	TCATC31980	TRANSISTOR,SILICON	KTC3198-AT(Y,GR)
⚠ Q508	BZ510077	TAAT012714	TRANSISTOR,SILICON	KTA1271_Y-AT
Q509	BZ510069	TCATC31980	TRANSISTOR,SILICON	KTC3198-AT(Y,GR)
⚠ Q512	BZ510004	TA3T016240	TRANSISTOR,SILICON	2SA1624-AA
⚠ Q514	BZ510070	TCAT032034	TRANSISTOR,SILICON	KTC3203_Y-AT
Q601	BZ510105	TCAT03209Y	TRANSISTOR,SILICON	KTC3209_Y-AT
Q602	BZ510105	TCAT03209Y	TRANSISTOR,SILICON	KTC3209_Y-AT
Q603	BZ510109	TCAA3875SY	TRANSISTOR,SILICON	KTC3875S_Y_RTK
Q604	BZ510105	TCAT03209Y	TRANSISTOR,SILICON	KTC3209_Y-AT
Q605	BZ510109	TCAA3875SY	TRANSISTOR,SILICON	KTC3875S_Y_RTK
Q606	BZ510105	TCAT03209Y	TRANSISTOR,SILICON	KTC3209_Y-AT
Q607	BZ510070	TCAT032034	TRANSISTOR,SILICON	KTC3203_Y-AT
Q611	BZ510105	TCAT03209Y	TRANSISTOR,SILICON	KTC3209_Y-AT
Q614	BZ510108	TAAA1504SY	TRANSISTOR,SILICON	KTA1504S_Y_RTK
Q709	BZ510108	TAAA1504SY	TRANSISTOR,SILICON	KTA1504S_Y_RTK
Q711	BZ510109	TCAA3875SY	TRANSISTOR,SILICON	KTC3875S_Y_RTK
Q712	BZ510109	TCAA3875SY	TRANSISTOR,SILICON	KTC3875S_Y_RTK
⚠ Q801	BZ510100	TCATC3199Y	TRANSISTOR,SILICON	KTC3199_Y-AT
⚠ Q802	BZ510100	TCATC3199Y	TRANSISTOR,SILICON	KTC3199_Y-AT
⚠ Q803	BZ510100	TCATC3199Y	TRANSISTOR,SILICON	KTC3199_Y-AT
⚠ Q804	BZ510091	TCA0042170	TRANSISTOR,SILICON	KTC4217(O,Y)
⚠ Q805	BZ510091	TCA0042170	TRANSISTOR,SILICON	KTC4217(O,Y)
⚠ Q806	BZ510091	TCA0042170	TRANSISTOR,SILICON	KTC4217(O,Y)
Q901	BZ510108	TAAA1504SY	TRANSISTOR,SILICON	KTA1504S_Y_RTK
Q902	BZ510108	TAAA1504SY	TRANSISTOR,SILICON	KTA1504S_Y_RTK
Q1001	BZ510068	TNAAJ05003	COMPOUND TRANSISTOR	KRC111SRTK
Q1503	BZ510109	TCAA3875SY	TRANSISTOR,SILICON	KTC3875S_Y_RTK
Q1504	BZ510109	TCAA3875SY	TRANSISTOR,SILICON	KTC3875S_Y_RTK
Q1507	BZ510109	TCAA3875SY	TRANSISTOR,SILICON	KTC3875S_Y_RTK
Q1508	BZ510109	TCAA3875SY	TRANSISTOR,SILICON	KTC3875S_Y_RTK
		COILS &TRANSFORMERS		
L301	BZ310041	02167F101J	COIL	100 UH
L402	AE000617	022100031A	COIL,LINEARITY	ELH5L7120N
L403	AD301606	02DK000058	COIL,CHOKE	02DK000058
⚠ L501	AD301124	029T000101	COIL,LINE FILTER	2R2A752F28Y
⚠ L503	AE000618	028R320005	COIL,DEGAUSS	8R320005
L901	BZ310041	02167F101J	COIL	100 UH
L1501	BZ310041	02167F101J	COIL	100 UH
L1502	BZ310039	02167F220J	COIL	22 UH
L1503	BZ310039	02167F220J	COIL	22 UH
L1505	AD300613	02167F150J	COIL	15 UH
L1508	BZ310041	02167F101J	COIL	100 UH
L1510	AD300613	02167F150J	COIL	15 UH
L1511	AD300613	02167F150J	COIL	15 UH
L1512	BZ310183	021LA6220J	COIL	22 UH
T401	BZ310189	0450190161	TRANS,HORIZONTAL DRIVE	ETH19Y203AY
⚠ T501	AD301355	048140065S	TRANSFORMER,SWITCHING	8140065S
		JACKS		
J701	AE002759	060J431020	RCA JACK	MSP-213V2-432_NI_LF
J702	AE006074	063Q700011	JACK	YKF51-5503N
J703	AE002759	060J431020	RCA JACK	MSP-213V2-432_NI_LF
J704	AE002761	060J411032	RCA JACK	MSP-213V1-652_NI_LF
J708	AE002759	060J431020	RCA JACK	MSP-213V2-432_NI_LF
J751	AE006073	060Q421048	RCA JACK	AV1-06ADS-2
J752	AE006072	060Q401109	RCA JACK	AV1-06AD-4
J753	AE006071	060Q401108	RCA JACK	AV1-06AD-3
⚠ J801	AD301356	066F130020	SOCKET,CATHODE RAY,TUBE	ISHS53S
		SWITCHES		
SW101	BZ612010	0504101T34	SWITCH,TACT	EVQ21505R
SW102	BZ612010	0504101T34	SWITCH,TACT	EVQ21505R
SW103	BZ612010	0504101T34	SWITCH,TACT	EVQ21505R
SW104	BZ612010	0504101T34	SWITCH,TACT	EVQ21505R
SW105	BZ612010	0504101T34	SWITCH,TACT	EVQ21505R
		VARIABLE RESISTORS		
VR401	BZ210218	V1K63H3BTE	VOLUME,SEMI FIXED	NVG6TLTAB222
VR502	BZ210101	V1163H4BTC	VOLUME,SEMI FIXED	EVNCYAA03BE4

ELECTRICAL REPLACEMENT PARTS LIST

Location No.	TSB P/N	Reference No.	Description	
		P.C.BOARD ASSEMBLIES		
PCB010	AE006078	A3N515H010	PCB ASS'Y	CMD016B
PCB110	AE006080	A3N515H110	PCB ASS'Y	CCD010B
PCB280	AE006081	A3N515H280	PCB ASS'Y	CED038A
		MISCELLANEOUS		
B401	BZ310129	024HT03564	CORE,BEADS	W4BRH3.5X6X1.0
B402	BZ310129	024HT03564	CORE,BEADS	W4BRH3.5X6X1.0
B405	BZ310129	024HT03564	CORE,BEADS	W4BRH3.5X6X1.0
⚠ B501	BZ310045	024AT03481	CORE,BEADS	BL02RN1-R62T2
⚠ B504	BZ310121	024HT03553	CORE,BEADS	W5RH3.5X5X1.0
BT001	AE005640	141R004016	BATTERY,MANGAN	GR03X-SP2
BT002	AE005640	141R004016	BATTERY,MANGAN	GR03X-SP2
⚠ CD501	AE006077	1209615904	CORD,AC BUSH	9615904
CD701	AE006076	06C3242006	CORD,CONNECTOR	C3242006
CD801	BZ614310	WCL6844038	FLAT CABLE AWM2468 A	WG26 5C GRAY 440MM
CD801	AE005894	06C3823005	CORD,CONNECTOR	C3823005
CD802	AE000651	WEL6858038	FLAT CABLE AWM2468 A	WG26 7C GRAY 580MM
CD805	AE005894	06C3823005	CORD,CONNECTOR	C3823005
CP101	BZ614102	0694270139	CONNECTOR PCB SIDE	173979-7
⚠ CP401	AE006075	069X460109	CONNECTOR PCB SIDE	B06B-DVS-L (LF)
CP402	BZ614058	069W010010	CONNECTOR PCB SIDE	005P-2100
CP403	BZ614058	069W010010	CONNECTOR PCB SIDE	005P-2100
⚠ CP501	BZ614176	069S320419	CONNECTOR PCB SIDE	A3963WV2-3PD
⚠ CP502	BZ614283	069S420110	CONNECTOR PCB SIDE	A1561WV2-2P
CP507	BZ614444	069D01001A	CONNECTOR PCB SIDE	003P-2100
CP508	BZ614444	069D01001A	CONNECTOR PCB SIDE	003P-2100
CP701	AD301998	069S240629	CONNECTOR PCB SIDE	A2001WV2-4P
CP803	BZ614269	069S320010	CONNECTOR PCB SIDE	A2361WV2-2P
CP805	BZ614269	069S320010	CONNECTOR PCB SIDE	A2361WV2-2P
CP806	BZ614058	069W010010	CONNECTOR PCB SIDE	005P-2100
CD1001	AE000620	06CH144704	CORD,CONNECTOR	CH144704
CP1001	AD301045	069S140419	CONNECTOR PCB SIDE	A2502WV2-4P
CP801A	BZ614276	067U005049	WIRE HOLDER	B2013H02-5P
CP801B	BZ614276	067U005049	WIRE HOLDER	B2013H02-5P
CP802A	AD301997	067U007029	WIRE HOLDER	B2013H02-7P
CP802B	AD301997	067U007029	WIRE HOLDER	B2013H02-7P
EL001	BZ614044	124120301A	EYE LET	XRY20X30BD
EL002	BZ614043	124116281A	EYE LET	XRY16X28BD
⚠ F501	BZ614422	081PC6R305	FUSE	51MS063L
⚠ FB401	AE003178	043232008F	TRANSFORMER,FLYBACK	FSU32A001_M
FH501	AE002634	06710T0009	HOLDER,FUSE	EYF-52BCY
FH502	AE002634	06710T0009	HOLDER,FUSE	EYF-52BCY
⚠ ICP501	AE000623	0835A05005	MICRO FUSE	20N_5000FSW
OS101	AD301048	0773071001	REMOTE RECEIVER	RPM7138-WH5
⚠ RY501	AE006070	0560X20118	RELAY	G5PA-1-SA(WEC)
⚠ SP1001	BZ614381	070C546004	SPEAKER	SG04H02BRA
⚠ SP1002	BZ614381	070C546004	SPEAKER	SG04H02BRA
⚠ TH501	BZ410079	DF5EL3R0A0	DEGAUSS ELEMENT	ZPB45BL3R0A
TM101	AE000622	076R0GW010	TRANSMITTER	R25-1939
⚠ TU001	AE006069	0163300018	RF UNIT	115-V-KA35ARB
⚠ V801	AE004439	0981320605	CRT W/DY	M80LNK085X90Y1J
X101	AD302002	100CT8R005	CRYSTAL	HC-49/U-S
X602	BZ613004	100CT3R505	CRYSTAL	HC-49/U

RESISTOR

RC.................. CARBON RESISTOR

CAPACITORS

CC.................. CERAMIC CAPACITOR
CE.................. ALUMI ELECTROLYTIC CAPACITOR
CP.................. POLYESTER CAPACITOR
CPP................. POLYPROPYLENE CAPACITOR
CPL................. PLASTIC CAPACITOR
CMP.................. METAL POLYESTER CAPACITOR
CMPL................ METAL PLASTIC CAPACITOR
CMPP................ METAL POLYPROPYLENE CAPACITOR

TOSHIBA CORPORATION

1-1, SHIBAURA 1-CHOME, MINATO-KU, TOKYO 105-8001, JAPAN